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HIDDEN VALLEY RESOURCES RESIDUALS REPOSITORY SAN BERNARDINO COUNTY, CALIFORNIA

DRAFT ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT

APPENDICES

Prepared for:

COUNTY OF SAN BERNARDINO
PLANNING DEPARTMENT

and

BUREAU OF LAND MANAGEMENT
BARSTOW RESOURCE AREA

Prepared by:



Chambers Group, Inc.

DECEMBER 1992

#29247182 ID 88069446 TD 1042 .C2 H53 1992 v.2

HIDDEN VALLEY RESOURCES RESIDUALS REPOSITORY,

SAN BERNARDINO COUNTY, CALIFORNIA

DRAFT

ENVIRONMENTAL IMPACT REPORT/

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APPENDICES

Prepared for:

COUNTY OF SAN BERNARDINO
PLANNING DEPARTMENT
385 No. Arrowhead Avenue
San Bernardino, California 92415

and

BUREAU OF LAND MANAGEMENT
BARSTOW RESOURCE AREA
150 Coolwater Lane
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Prepared by:

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DECEMBER 1992

RECYCLED PAPER

HIDDEN VALLEY RESOURCES RESIDUALS REPOSITORY
SAN BERNARDINO, CALIFORNIA

DRAFT
ENVIRONMENTAL IMPACT REPORT/ENVIRONMENTAL IMPACT STATEMENT

APPENDICES

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APPENDIX A

COUNTY NOTICE OF PREPARATION
BLM NOTICE OF INTENT
AND
COMMENTS FROM RESPONSE PERIODS AND SCOPING MEETINGS

LAND MANAGEMENT DEPARTMENT

385 North Arrowhead Avenue • San Bernardino, CA 92415-0180 • (714) 387-4091

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

JOHN N. JAQUESS
Land Management Director

OFFICE OF PLANNING
Sharon W. Hightower
County Planning Officer

OFFICE OF SURVEYOR
Claude D. Tomlinson, L.S.
County Surveyor

OFFICE OF BUILDING AND SAFETY
Larry L. Schoelkopf, P.E.
County Building Official

November 6, 1989

Christine Kinne
Office of Permit Assistance
1400 10th Street
Sacramento CA 95814

RE: Hidden Valley Resources Hazardous Waste Management Facility

Dear Ms. Kinne:

This letter is sent to confirm our telephone conversation of November 6, 1989. The Land Management Department has accepted the filing of an application for a General Plan Amendment and a Conditional Use Permit, by Hidden Valley Resources, for the purpose of siting a Hazardous Waste Management Facility. The application was accepted as complete on October 27, 1989.

Please coordinate the scheduling of the "post application" meeting with County staff so that we may conduct public scoping of the Environmental Impact Report for this project.

If you have any questions, please call me at (714) 387-4146.

OFFICE OF PLANNING

Paul Kielhold

PAUL KIELHOLD, ENVIRONMENTAL ANALYST
ENVIRONMENTAL ANALYSIS TEAM

cc: Marsha Turoci
Sharon Hightower
Valery Pilmer
Paul Glass
Mike Williams
Paul Ryan
Pam Bennett
Pete Brierty
Brian Patrick
Steve Lilburn

HVR.LTR.OPA

SAN BERNARDINO COUNTY
INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

This form and the descriptive information in the application package constitute the contents of an Initial Study pursuant to County Guidelines under Ordinance 3040 and CEQA Guidelines §15063.

I.

USGS Quad: Hidden Valley
East and West

T,R,Section: TN9, R6E, 2-6;
T9N, R5E, 1; T10N, R6E, 26-35;
T10N, R5E, 25, 36

(place project label here)

Thomas Bros: 705-706

(attach copy of USGS quad showing project location)

Planning Area: North Desert

OLUD: RC
Improvement Level: 5

PROJECT CHARACTERISTICS: Hidden Valley Resources, Inc. proposes to construct and operate a specified hazardous waste facility (Residuals Repository) in the Cady Mountains. The proposed project will consist of a receiving/transfer facility, a containment storage area, and road and rail access. The receiving area will include an administration building, equipment and maintenance shop, security and fire station, testing laboratory, rock plant and concrete batch plant (for construction of containment structures), and rail and truck facilities on approximately 28.3 acres. The initially developed containment area will consist of a series of concrete and steel subsurface vaults developed on approximately 25 acres. The containment/storage area will be developed on a phased basis at a projected rate of 5 - 10 acres per year. Phase I of the proposed project consists of 1,500 acres and the total site is 11,500 acres.

ENVIRONMENTAL/EXISTING SITE CONDITIONS: The proposed site is in Hidden Valley which extends approximately 6 miles in length from east to west, and 3 miles in width from north to south. Surface elevations range from 2,300 to 2,800 feet above sea level (asl). Surrounding mountains range from 3,000 to 4,600 asl. The area is uninhabited open space currently used as range land. The valley is divided into two surface drainages, the western portion is a closed surface drainage, draining to Hidden Valley Dry Lake. A well is located within this valley floor and is used to provide water for cattle. The eastern portion of the valley drains to a series of dry washes and exits the valley through Hidden Valley wash on the northeast side of the valley. A dirt road provides access to the valley from the west.

	EXISTING LAND USE	OFFICIAL LAND USE DISTRICT	IL
North	OPEN SPACE	RC	5
South	OPEN SPACE	RC	5
East	OPEN SPACE	RC	5
West	OPEN SPACE	RC	5

II. Identification of maximum potential environmental effects of the proposed project.

The purpose is to identify any potentially significant impacts and discuss mitigation measures for identified impacts. Please substantiate your responses by summarizing your assessment of significant impacts and referencing documents used as research (e.g., Norton Air Force Base AICUZ study re: Noise). Include quantification of changes caused by the project's development at maximum potential buildout from existing status.

Circle or underline specific item of concern for "yes" or "maybe" answers if one item applies and others do not. If an impact that would be significant can be mitigated below a level of significance, indicate by checking "yes" or "maybe" with an "→" to "no" and discuss mitigative measure(s) under substantiation. Substantiation is also necessary for "no" answers.

NATURAL HAZARDS

	Yes	Maybe	No
1. Geologic Hazards. Will the proposed project result in significant impacts related to:			
a. Unstable earth conditions or changes in geologic substructures?		X	
b. Change in topography or ground surface relief features?		X	
c. The destruction, covering or modification of any unique geologic or physical features?		X	
d. Exposure of people or property to geologic hazards such as earthquakes, landslides, mudslides, ground failure, or similar hazards?		X	
e. Exposure of people or property to water-related seismic hazards such as seiche?			X

SUBSTANTIATION (check ___ if project is located in the Geologic Hazards Overlay District):

1.a. Holocene alluvium occurs to a depth of 200 feet. Underlying sediments to approximately 400 feet are quaternary alluvium. Approximately 575 feet of tertiary basaltic rock underlie the sediments. These all overlay a basalt formation extending from approximately 975 feet

to an unknown depth. Three faults occur within 20 miles of the site. One is known to be active and the other two form groundwater barriers. Another potentially active fault (Cady fault) occurs along the site's southern edge (see Appendices B, C, T).

1.b. The topography of the site will be slightly altered by construction of the support facilities and containment areas. Standard grading and development conditions will be applied to the project.

1.c. Geologic studies prepared for the site (see Appendices B, C) do not indicate the presence of any unique geologic or physical features. The 40 acre Hidden Valley Dry Lake or playa will not be disturbed. A minimum 200-foot setback from its 100-year floodplain will be established.

1.d.& e. The Cady fault (the nearest fault to the proposed site) does not show any evidence of historic movement. Movement on the fault has been over 100,000 years before present.

	Yes	Maybe	No
2. **Flood Hazards.** Will the proposed project result in significant impacts related to:			
a. Changes in currents, or the course of direction of water movements?		X	
b. Changes in deposition, erosion, or siltation that may modify the channel of a river, stream, bay, inlet, or lake?		X	
c. Alterations to the course or flow of flood waters?		X	
d. Change in the amount of surface water in any water body?			X
e. Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff?		X	
f. Exposure of people or property to water-related hazards such as flooding or dam inundation?			X

SUBSTANTIATION (check if project is located in the Flood Plain Safety Overlay District ___ or Dam Inundation Overlay ___):

2.a. There are no perennial streambeds on the proposed site. Local drainage patterns may be affected by the project.

2.b Additional runoff from areas of impervious material is not expected to cause changes on deposition, erosion, or siltation to Hidden Valley Dry Lake (see Surface Water Hydrology Investigation, Appendix E).

2.c. Two blueline stream channels flow north through the 25 acre repository site to the Hidden Lake playa. All facilities will be setback a minimum of 50 feet from calculated 100-year flood plains of streams and 200 feet from calculated 100-year floodplain of Hidden Valley Dry Lake. The use of impervious materials will be limited. All development will be reviewed by appropriate regulatory agencies prior to construction to ensure natural drainage features are not adversely affected. See Appendix E for stream and runoff calculations.

2.d. The amount of surface water flowing into the local stream channels and Hidden Valley Dry Lake will be minimal due to the dry climate and the limited use of impervious materials onsite. Valley areas onsite would require storms with intensities greater than 100-year, 1-hour events to generate surface flow.

2.e. Natural drainage patterns will be maintained onsite and impervious materials limited to reduce changes in absorption rates. Roads will be graveled and cross natural channels at grade where possible. All repository structures will be placed underground but slightly elevated to reduce water encroachment. Following placement, the structures will be capped and covered with native soils and revegetated.

2.f. Adequate setbacks from potential flooding will eliminate water-related hazards to people and property.

	Yes	Maybe	No
3. **Fire Hazards.** Will the proposed project result in significant impacts related to:			
a. Exposure of people or property to wildland fires?			X
b. Man-made fire hazard?			X

SUBSTANTIATION (check ___ if project is located in the Fire Safety Overlay District):

3.a.& b. The project area's sparse vegetation is not favorable for wildland fires. No residential units will be onsite and an onsite fire station will be built. All County Fire Codes concerning structures, waterflow, and water supply will be implemented to reduce potential impacts.

	Yes	Maybe	No
4. **Wind/Erosion.** Will the proposed project result in significant impacts related to:			
a. Any increase in wind or water erosion of soils, either on or off the site?			X

SUBSTANTIATION:

4.a. The construction of the proposed facilities will temporarily increase the potential for wind erosion. Measures to reduce wind erosion will be implemented and include minimal grading of site, spraying of water or dust palliatives on disturbed areas, compacting soil, and the prompt revegetation of disturbed areas around facilities and on the cover of the repository (see Appendix L).

MANMADE HAZARDS

	Yes	Maybe	No
5. **Noise.** Will the proposed project result in significant impacts related to:			
a. Increases in existing noise levels?			X
b. Exposure of people to severe noise levels?			X -> X

SUBSTANTIATION (check if the project is located in the Noise Hazard Overlay District ___ or is subject to severe noise levels according to the General Plan Noise Element ___):

5.a. An Acoustic Assessment Report was prepared on the proposed project by Illingworth and Rodkin, Inc., and is included as Appendix M in the application. The report states that the construction and operation of the project will not significantly affect existing sensitive noise receptors. The nearest residence is located 10 miles west and is protected by a series of ridges. Measures to reduce onsite noise for the protection of employees (see 5.b.) will also serve to decrease offsite noise impacts.

5.b. The plant equipment does have the potential to generate noise levels which would pose a threat to the hearing of employees. Therefore, all feasible engineering solutions should be considered during site design to meet Cal-OSHA's noise limits. This would include enclosing stationary equipment, installing heavy duty mufflers on mobile equipment, and tuning all engines and equipment. Hearing protectors may be the only feasible solution for employees using certain pieces of equipment. A hearing conservation program for employees may be required to assure compliance with Cal-OSHA standards.

	Yes	Maybe	No
6. **Aviation Safety.** Will the proposed project result in significant impacts related to:			
a. Exposure of people to risk from aircraft operations?			X

SUBSTANTIATION (check _X_ if project is located in the Airport Safety Overlay District):

6.a. The project site is located within an Aviation Safety Area 4 due to a low altitude flight corridor. The County General Plan states that industrial sites are normally acceptable in this overlay district. Appropriate military facilities will need to be contacted regarding the project. This issue will be further considered in the EIR.

	Yes	Maybe	No
7. **Hazardous/Radioactive Materials.** Will the proposed project result in significant impacts related to:			
a. A risk of an explosion or the release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation) in the event of an accident or upset conditions?			X
b. Possible interference with an emergency response plan or an emergency evacuation plan?			X
c. Creation of any health hazard or potential health hazard?			X
d. Exposure of people to potential health hazards?			X

SUBSTANTIATION:

7.a. Hazardous waste on site would be limited to heavy metals. Uncontrolled exposure to employees is unlikely but the potential could exist. This will be discussed in the EIR. Explosions would not be possible from the storage of hazardous waste and would be limited to fuel storage containers on site. The transportation methods (truck and rail), containers, routes, and safety measures of the accepted hazardous waste will be discussed in the EIR. The potential for accidents and the response to a possible truck or rail accident will be evaluated.

7.b. Emergency response will be enhanced with the construction and operation of a fire station on site. An Emergency Action Plan consistent with all applicable County, State, and Federal regulations will be drafted, reviewed with all employees, and posted in appropriate areas of the facility. The plan will encompass a community involvement/awareness element and will be reviewed by all appropriate County, State, and local emergency services. The plan will address all possible emergency situations including situations which might endanger health and safety of on site employees.

7.c.& d. The intent of the project is to isolate and contain treated hazardous waste, and to prevent exposure to the public now or in the future. The potential benefits or

adverse impacts to public health and safety will be addressed in the EIR. Strict guidelines for handling and storage will be implemented on site to insure employee safety.

NATURAL RESOURCES

	Yes	Maybe	No
8. **Biological Resources.** Will the proposed project result in significant impacts related to:			
a. Loss, reduction, or deterioration of habitat and/or change in diversity of species of plants or animals?		X	
b. Reduction of the numbers of any unique, rare, threatened, or endangered species of plants or animals?		X	
c. Introduction of exotic species of plants or animals into an area, or in a barrier to the normal replenishment or migration of existing species?		X	

SUBSTANTIATION (check if project is located in the Biological Resources Overlay ___ or contains habitat for any species listed in the California Natural Diversity Database ___):

8.a. The initial development will result in the loss of approximately 240 acres of creosote bush-burrobush habitat. This habitat type covers seventy percent of the Mojave Desert. On site, this habitat serves as foraging area for raptors and badger, and "fair" desert tortoise habitat (see Appendix H).

8.b. The project could result in a reduction of the number of Desert tortoise on the site (see Appendix H).

8.c. The proposed facility does not include any activities that will introduce exotic species of plants or animals into the area, but the access road and rail spur line could serve as a partial barrier to the movement of the desert bighorn sheep (Ovis canadensis nelsoni) in the Cady Mountains.

	Yes	Maybe	No
9. **Cultural/Paleontologic Resources.** Will the proposed project result in significant impacts related to:			
a. The alteration or destruction of a prehistoric or historic archaeological site?			X
b. Physical or aesthetic effects to a prehistoric or historic building, structure, or object?			X
c. A physical change that would affect unique ethnic cultural values?			X
d. Restricting existing religious or sacred uses within the potential impact area?			X
e. Any alteration or destruction of fossil remains?			X

SUBSTANTIATION (check if the project is located in the Cultural __ or Paleontologic ____ Resources overlays or cite results of cultural resource review):

9.a. - e. The Cultural Resources report conducted in March 1989 recommended that a formal archaeological survey be done to identify any cultural resources that may be impacted by the project (see Appendix I).

A 100% Cultural Resources Inventory was conducted for the entire site in July 1989. The report appears as Appendix K. Thirty-three sites were discovered within the project area, one outside the area, and no sites within the access route. Testing of 19 of the identified sites is recommended.

	Yes	Maybe	No
10. **Air Quality.** Will the proposed project result in significant impacts related to:			
a. Substantial air emissions or deterioration of ambient air quality?			X
b. The creation of objectionable odors?			X

	Yes	Maybe	No
c. Alteration of air movement, moisture or temperature, or any change in climate, either locally or regionally?			X

SUBSTANTIATION (discuss conformity with the South Coast Air Quality Management Plan, if applicable):

10.a. The primary air pollutants associated with the construction and operation of the project will be fugitive dust and diesel engine exhausts. Construction of access roads, facilities, and the repository will require grading, trucking materials, employee travel, and excavating and backfilling of aggregate materials for the repositories. Operation of the project will produce dust and engine exhausts related to the transport of aggregate materials, the operation of the concrete plant, employee commuting, and the truck and rail deliveries of hazardous wastes.

An air quality assessment was prepared for the project and is included in Appendix L. Impacts associated with construction activities are temporary and not considered significant. Mitigation measures will be required during construction activities to reduce emission and dust. Operations will primarily produce dust emissions of which PM10 is regulated. Modeled impacts using a 24-hour worst case scenario for Ludlow is 0.716 ug/m^3 (compared to the California standard of 50 ug/m^3 and the estimated ambient air quality of 32 to 40 ug/m^3).

The construction and operation of the site will comply with all applicable SBCAPCD rules.

10.b. The release of odors from hazardous waste is unlikely due to the nature of accepted waste and the sealed containers used for transport and storage. Monitors will be installed to detect gases associated with odors. This issue will be discussed further in the EIR.

10.c. Minor changes in wind flow may occur around the facility however, no other potential changes in physical climatic variables have been identified.

	Yes	Maybe	No
11. Water Supply/Water Quality. Will the proposed project result in significant impacts related to:			
a. Changes in the quantity of groundwaters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations (onsite)?			X
b. Substantial reduction in the amount of water otherwise available for public water supplies?			X
c. Alteration of the direction or rate of flow of groundwaters?			X
d. Pollution, contamination, or any change in the quality of groundwater (toxics, nitrates, fluorides, salts, etc.)?			X
e. Discharge into surface waters, or any alteration of surface water quality, including, but not limited to, temperature, dissolved oxygen, or turbidity?			X

SUBSTANTIATION:

11.a. A Groundwater Hydrology Study (see Appendix Q) evaluated existing groundwater conditions for the site.

Hidden Valley is a 3-mile wide by 6-mile long alluvial filled valley near the crest of the Cady Mountains. The maximum thickness of the sedimentary deposits in Hidden Valley is 583 feet (based on gravity measurements). Hidden Valley is on the surface-water drainage divide between the Mojave River drainage (north of Hidden Valley) and the Hector-Ludlow ground-water area (south of Hidden Valley). In general, all groundwater flows to the east. Groundwater levels are higher in altitude beneath Troy Lake than those under Hidden Valley, Soda Lake, and the Hector-Ludlow area.

Groundwater beneath Hidden Valley is in volcanic rock which lies below the dry sedimentary deposits. Water pumped from one well (pumping rate: 3gpm) in Hidden

Valley between 1954 (when the well was drilled) and 1959 (when the well went dry) caused 130 feet of water-level decline. This indicates that the volcanic rock has a very low permeability and storage capacity. Some of the wells drilled in sediments that surround the Cady Mountains produce well yields in excess of 2,500 gpm. The water-level declines in the surrounding sedimentary deposits have declined about 10 feet in over 30 years of pumping by over 100 large wells and numerous small wells.

The quality of groundwater beneath Hidden Valley is very good. The Total Dissolved Solids (TDS) of water under Hidden Valley is 497 milligrams per liter (mg/l) and meets all the requirements set by the Environmental Protection Agency (EPA) for drinking water except for Nitrate (NO_3) and Iron (Fe). Water from this well in Hidden Valley has 52.3 mg/l of NO_3. The recommended upper limit for drinking water set by the EPA is 45 mg/l for NO_3.

When the water from beneath Hidden Valley is compared with the water from the nearest wells to the west, northeast and southeast of Hidden Valley, the data shows the chemical quality is drastically different. The water beneath Hidden Valley meets all the requirements from drinking water except for nitrate and iron. None of the 3 wells that surround Hidden Valley meet the EPA's drinking water standards due to high levels of TDS.

Impacts of the project on the groundwater will be evaluated in the EIR.

11.b. Water is not extracted from Hidden Valley for public water supplies. If water is imported from surrounding areas, it may reduce water available for public supplies. This issue will be evaluated in the EIR.

11.c. The use of groundwater may potentially alter the direction or rate of flow of groundwaters and this issue will be discussed in the EIR.

11.d. Depth to groundwater is approximately 1,030 feet. The waste containment systems for the proposed development will consist of zero-discharge, fully-contained concrete or steel structures for permanent isolation. These structures will be located above the groundwater table and monitored for leakage. In the event of system failure, the material would be confined to the valley basin, allowing isolation and decontamination without affecting areas outside the valley. The potential for release of pollutants and the potential for significant

contamination of ground water resources in the basin will be evaluated in the EIR.

11.e. The applicant proposes to transfer all hazardous wastes in secured, sealed containers and will monitor for spillage during storage and transfer. All unloading and decontamination facilities will be located within the closed surface-water drainage basin in the western half of Hidden Valley. Any accidental spillage would be confined to the basin. Lined evaporation ponds will collect any pavement runoff from the transfer/shop facilities to prevent polluted runoff from flowing into natural soils. Discussion of the projects impacts on this issue will be included in the EIR.

The management of onsite surface runoff and the possible release of contaminants to infrequent ponded surface water on Hidden Valley lake bed will be evaluated for potential impact in the EIR. This investigation will include an evaluation of the various pathways that contaminants could reach surface water from the facility.

	Yes	Maybe	No
12. Open Space/Recreation/Scenic. Will the proposed project result in significant impacts related to:			
a. The quality or quantity of existing recreational opportunities?		X	
b. The obstruction of any scenic vista or view open to the public?		X	
c. The creation of an aesthetically offensive site open to public view?		X	
d. New light or glare?		X -> X	

SUBSTANTIATION (check ___ if project is located within the viewshed of any Scenic Route listed in the General Plan):

12.a. The site is used infrequently by recreationalists for horse-back riding and off-road vehicles. The site is also within Wilderness Study Area 251. Potential impacts to recreation and to the BLM designated WSA 251 will be evaluated in the EIR.

12.b.& c. The project site is located 10 miles north of Interstate 40 at the Hector intersection. The site is completely

surrounded by mountains and is accessible via a dirt road. Motorists from I-40 will not be able to see the site and there are no readily accessible areas for the public to view the site. In addition, containment areas will be constructed underground with surface soils revegetated.

12.d. The facility will be operated 8 hours per day during regular business hours. A second shift may be necessary for fabrication work and maintenance. Security and safety personnel will be present 24 hours per day. Night lighting will be minimized to prevent any significant light or glare. The applicant shall submit a lighting design and installation plan that will direct light internally and prevent light or glare from extending beyond the property boundaries. With implementation of these mitigation measures, the impact from light and glare will not be significant. This issue will not be addressed further in the EIR.

	Yes	Maybe	No
13. **Soils/Agriculture.** Will the proposed project result in significant impacts related to:			
a. Disruptions, displacements, compaction, or overcovering of the soil?		X	
b. Loss of agricultural soils?			X
c. Reduction in acreage of any agricultural crop?			X

SUBSTANTIATION (check ___ if project is located in the Important Farmlands Overlay):

13.a. Surface soils will be altered during construction of the facility. Construction of containment vessels will require soil alteration and removal. Depths of containment vessels will vary due to the depth of bedrock on which the vessels will rest. Impacts to soils and topography will be addressed in the EIR.

13.b. The area is not currently zoned or utilized for agricultural purposes. Grazing does occur but the lands carrying capacity and water supply is limited.

13.c. The site is not used for the production of agricultural crops.

	Yes	Maybe	No
14. **Mineral Resources.** Will the proposed project result in significant impacts related to:			
a. The prohibition or restriction of development of any mineral resource rated as Classified or Designated by the State Mining and Geology Board?		X	

SUBSTANTIATION (check ___ if project is located within the Mineral Resource Zone Overlay):

14.a. A Mining Feasibility Study was prepared for the site area and is included as Appendix P. The report concluded that there are many mines in the Cady Mountains surrounding the proposed hazardous waste residual repository site. They contain a variety of minerals in relatively small to moderate amounts. There have never been any mines developed on the site and there are no known mineral deposits on the site except for sand and gravel. Sand and gravel could be mined in several areas within and adjacent to the site.

MANMADE RESOURCES

	Yes	Maybe	No
15/16. **Utilities/Infrastructure.** Will the proposal result in significant impacts related to a need for new systems, or substantial alterations to the following utilities:			
a. Power or natural gas?		X ->	X
b. Communications systems?		X ->	X
c. Water?			X

	Yes	Maybe	No
d. Sewer?		X ->	X
e. Storm water drainage?		X	
f. Solid waste and disposal?		X ->	X

SUBSTANTIATION:

15/16.a Electrical service will be provided by Southern California Edison. Required facilities will be constructed at the applicant's expense. Significant new systems will not be required. This issue will not be evaluated in the EIR. Natural gas will not be required.

15/16.b. Communications services will be provided as needed. Radio telephones would eliminate the need for wired connections although this service could be installed in conjunction with electricity. This issue will not be addressed in the EIR.

15/16.c. Water on site is limited and will require importation for domestic and construction usage. Water will be trucked from a readily available commercial source. Impacts to water resources will be assessed separately as part of the water supply/quality evaluation.

15/16.d. Sewage disposal will be provided with onsite septic systems under permit from the County Environmental Health Services Department and in cooperation with the Regional Water Quality Control Board. Sewage disposal will be limited. Adverse impacts are not anticipated. This issue will not be addressed in the EIR.

15/16.e. Stormwater drainage will be diverted by the development and ultimately redirected into the natural drainage. This issue will be addressed as part of the Hydrologic Investigation in the EIR.

15/16.f. Non-hazardous solid waste will be collected at the site and transported by commercial hauler for disposal at an appropriately classified landfill site. The closest landfill is currently in Newberry Springs, however, it is slated for closure by the County. Ultimate disposal will probably occur at a site near Barstow. Total quantities will be limited to that generated by employees onsite. Compliance with operations plans will prevent mixing with the hazardous waste stream. The project will have no significant adverse impact on existing solid waste disposal systems and will not be addressed further in the EIR.

	Yes	Maybe	No
17. Transportation/Circulation. Will the proposed project result in significant impacts related to:			
a. Generation of substantial additional vehicular movement?			X

		Yes	Maybe	No
b.	Effects on existing parking facilities, or demand for new parking?			X
c.	Substantial effect upon existing transportation systems?		X	
d.	Alterations to present patterns of circulation or movement of people and/or goods?		X	
e.	Alterations to waterborne, rail, or air traffic?		X	
f.	Increase in traffic hazards to motor vehicles, bicyclists, equestrians, or pedestrians?		X	

SUBSTANTIATION:

17.a.- f. A Traffic Analysis was prepared (see Appendix N) and is included in the application. The transportation-related concerns about the project deal with the access road to the proposed facility and the connection and overlapping of the actual rail and vehicular travel corridors. Since no roadway facility exist to the proposed site at this time, proper engineering should be included in the design of the roadway which will connect the treatment facility to Hector Road and I-40 freeway. At a minimum, the roadway should be fully improved to accommodate one lane of traffic in each direction and the use of this roadway by heavy truck traffic.

Safe and efficient traffic control devices should be installed, where necessary, to provide safe and adequate access to and from the planned facility for both the anticipated truck and rail traffic. The possibility of truck and rail accidents and safety procedures will be discussed in the EIR.

		Yes	Maybe	No
18.	**Energy.** Will the proposed project result in significant impacts related to:			
a.	An increase in the rate of consumption of any natural resources?		X	
b.	Use of substantial amounts of fuel or energy?			X

c. Substantial increase in demand upon existing sources of energy, or require the development of new sources of energy? X

SUBSTANTIATION:

18.a. The project will not significantly increase the rate of consumption of any material resource except for the possibility of water and aggregate which will be evaluated in the EIR.

18.b.& c. No substantial energy consumption will be required onsite besides low levels of electricity. Fuel consumption should actually be decreased as the site is closer in distance from southern California generation points than to existing hazardous waste sites (which will soon be closed). The use of rail will also decrease the consumption of fuel.

	Yes	Maybe	No

19. **Housing/Demographics/Socioeconomics.** Will the proposed project result in significant impacts related to:

a. An effect on existing housing, or creation of a demand for additional housing? X

	Yes	Maybe	No

b. Alteration of the location, distribution, density, or growth rate of the human population of the area? X

SUBSTANTIATION:

19.a.& b. Approximately 36 to 60 employees will be required onsite. This number of employees should have no effect on existing housing nor on the population of the area.

	Yes	Maybe	No

20. **Public Services.** Will the proposed project result in significant impacts related to a need for new or altered governmental services in:

a. Fire protection? X -> X

b.	Police protection?	X -> X
c.	Schools?	X
d.	Parks or other recreational facilities?	X
e.	Maintenance of public facilities, including roads?	X
f.	Other governmental services?	X -> X

SUBSTANTIATION:

20.a. Fire protection will be provided by an onsite fire station with fire personnel specifically trained to handle all project-related fires. All building fire codes and water flows and storage will be complied with. The type of hazardous wastes deposited onsite will be non-flammable. This issue will not be evaluated in the EIR.

20.b. The operational areas will be surrounded by a security fence and will be manned by a 24-hour security force. Operations at the site may increase the demand for law enforcement services, but no significant potential increase is identifiable. This issue will not be evaluated in the EIR.

20.c. The Silver Lakes School District and Barstow Unified School District are expected to provide educational services for children of employees at the repository. An estimated 36 to 60 employees may relocate to the region and 36 to 60 school age children may be generated by this relocation within the above school districts. The additional of up to 60 students in the region is not considered a significant impact on the region's education system. This issue will not be evaluated in the EIR.

20.d. The project site does not directly impact any park or recreation facilities. The addition of up to 60 possible families to the region is not considered a significant increase in demand for use of recreation facilities of the regional based on the small increase relative to the area's population. This issue will no be evaluated in the EIR. The WSA status and open space resource will be discussed under Land Use.

20.e. No additional measurable demand will be placed on maintenance of existing public facilities. The road to

the project site will be constructed to County standards and offered to the County for dedication. If not accepted, the road will be maintained by the applicant. No impacts are projected and this issue will not be evaluated in the EIR.

20.f. The project may place additional demand of the County Department of Environmental Health Services for review and inspection of disposal operations. The applicant shall mitigate this potential impact by providing funding for County staff effort, as part of fees accepted at the site. The impact to other governmental services remains to be defined. This issue will be evaluated in the EIR based on the input received during the scoping process.

LAND USE

	Yes	Maybe	No
21. Will the proposed project result in significant impacts related to:			
a. A substantial alteration of the present or planned land use of an area? (Consider the Official Land Use Designation of the project site and surrounding property, as well as their Improvement Level designations on the General Plan Infrastructure Overlay and any relevant Resource Overlays.)		X	

SUBSTANTIATION:

21.a. Development of the proposed project will introduce a new use into the area that can be considered a substantial alteration of the present and planned uses in Hidden Valley and the region. A detailed land use evaluation will be presented in the EIR that will evaluate BLM, County, and other pertinent plans for the region. The evaluation will assess the proposed project in relation to the siting criteria for Hazardous Waste Management Facilities contained in the County Hazardous Waste Management Plan. It will also address the potential for significant land use conflicts and land use incompatibilities.

	Yes	Maybe	No
22. MANDATORY FINDINGS OF SIGNIFICANCE			
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X	
b. Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals? (A short-term impact on the environment is one which occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)		X	
c. Does the project have impacts which are individually limited, but cumulatively considerable? (A project may impact on two or more separate resources where the impact on each resource is relatively small, but where the effect of the total of those impacts on the environment is significant.)		X	
d. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X	

SUBSTANTIATION:

The HVR Residual Repository will introduce a new land use to the area initially converting approximately 60 acres from open space/rangeland to the proposed project use. Phase I of the proposed project consists of approximately 1,500 acres of potential storage area. The containment/storage area will be developed on a phased basis at a projected rate of approximately 5 - 10 acres per year. The construction and operation of the facility have been analyzed by a number of independent experts and will be further evaluated in the Environmental Impact Report to be prepared. The following issues will be addressed in the EIR: Geologic Hazards/Mineral Resources, Hydrology/Flood Hazards, Fire Hazards, Wind/Erosion, Noise,

Aviation Safety, Hazardous Waste/Materials, Biologic Resources, Cultural/Paleontological Resources, Air Quality, Open Space/Recreation/Scenic/Visual Resources, Water Supply/Water Quality, Soils, Transportation/Circulation, Energy, and Land Use. Cumulative impacts and site alternatives will also be addressed.

III. Discussion of Environmental Evaluation:

Please refer to the substantiation discussion included under each issue above.

IV. Mitigation Measures to be included in project Conditions of Approval/Mitigation Monitoring Program:

Mitigation measures to be included in the Conditions of Approval and Mitigation Monitoring Program will be developed through the EIR process.

Initial Environmental Evaluation Prepared By:

Martha P Lauer — December 5, 1989

Signature — Date

On the basis of this initial evaluation:

The proposed project WOULD NOT have a significant effect on the |____| environment (Mitigation Measures are included within the project's Conditions of Approval/Mitigation Monitoring Program), and a NEGATIVE DECLARATION should be prepared.

The proposed project MAY have a significant adverse effect on the |__✓__| environment, and an ENVIRONMENTAL IMPACT REPORT should be required.

Paul D. Laos — 12-5-89

Signature — Date

For The Planning Agency

REFERENCES

Specified Hazardous Waste Facility Land Use Application and Facilities Plan, Hidden Valley, California, Hidden Valley Resources, Inc., October 1989.

San Bernardino County Air Pollution Control District, 1988. Rules and Regulations, December.

San Bernardino County Air Pollution Control District, 1988. Interoffice memo from Walter R. Mook to Paul Kielhold regarding Draft EIR on County of San Bernardino's Proposed Hazardous Waste Management Plan, November 2.

San Bernardino, County of, 1988q. Draft County Hazardous Waste Management.

San Bernardino, County of, 1988a. General Plan Update (revised February 1989).

San Bernardino, County of, 1988b. Background Report: Land Use.

San Bernardino, County of, 1988i. Background Report: Hazardous Waste/Materials.

San Bernardino, County of, 1979. San Bernardino County Consolidated General Plan, amended through 1986.

San Bernardino, County of, 1973. Conservation and Open Space Report Elements of the San Bernardino General Plan.

Appendices from Specified Hazardous Waste Facility Land Use Application and Facilities Plan, Hidden Valley Resources, Inc. October 1989.

Appendix B - Technical Report: Geologic Mapping at Hidden Valley, California, W.R. Moyle, Jr., April 1989.

Appendix C - Technical Report: Seismic Data for the Mojave Desert and Hidden Valley, California, W.R. Moyle, Jr., February 1989.

Appendix D - Technical Report: Climatic Report for the Mojave Desert and Hidden Valley, California, W.R. Moyle, Jr., January 1989.

Appendix E - Technical Report: Surface Water Hydrology Investigation, Hidden Valley, California, Patrick & Henderson, Inc., April 1989.

Appendix F - Technical Report: Benefits of Underground Contain-

ment Structures for the Hidden Valley Hazardous Waste Residual Repository Site, Patrick & Henderson, Inc., April 1989.

Appendix G - Technical Report: Preliminary Design Concepts for Containment Structures Hidden Valley, California, Patrick & Henderson, Inc., March 1989.

Appendix H - Technical Report: Biota Report and Impact Assessment - Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, J & M Land Restoration, Inc., November 1988.

Appendix I - Technical Report: A Cultural Resource Overview for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, Mark Sutton, Cultural Resource Facility, CSU Bakersfield, March 1989.

Appendix J - Technical Report: Characterization of Hazardous Waste Treatment Residuals, Planning Consultants Research, February 1989.

Appendix K - Technical Report: Cultural Resources Inventory for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, Mark Sutton, and R.E. Parr, Cultural Resource Facility, CSU Bakersfield, July 1989.

Appendix L - Technical Report: Air Quality Assessment for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, Goddard & Goddard Engineering, September 1989.

Appendix M - Technical Report: Acoustical Assessment Report for the Proposed Hidden Valley Hazardous Waste Disposal Facility, County of San Bernardino, California, Illingworth and Rodkin, Inc., July 1989.

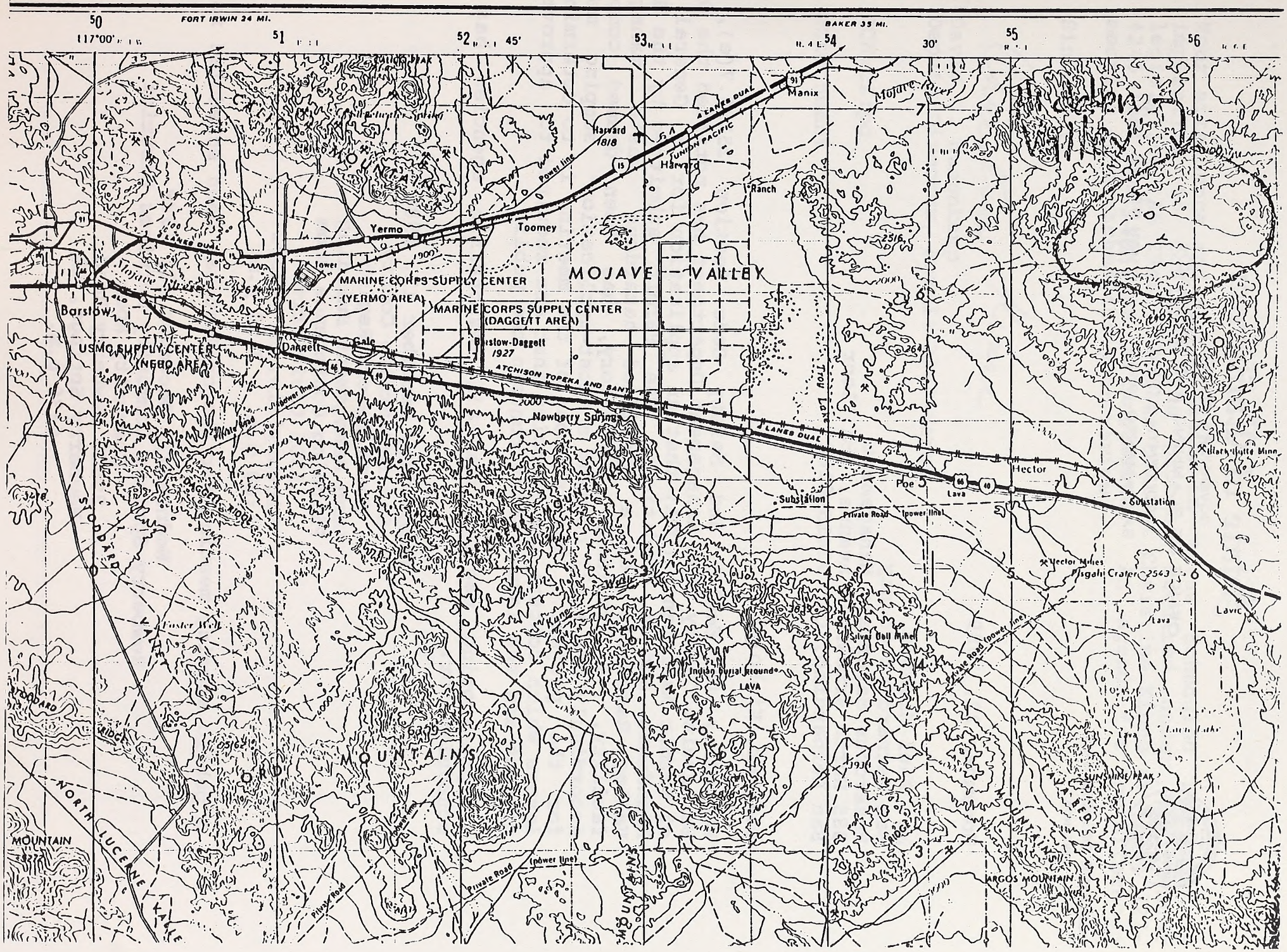
Appendix N - Technical Report: Circulation Assessment for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, KHR Associates, October 1989.

Appendix O - Technical Report: Gravity Survey for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, W.R. Moyle, Jr., June 1989.

Appendix P - Technical Report: Mining Feasibility for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, W.R. Moyle, Jr., June 1989.

Appendix Q - Technical Report: Groundwater Hydrology Study for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, W.R. Moyle, Jr., September 1989.

Appendix R - Technical Report: Contamination Assessment for the Proposed Hidden Valley Hazardous Waste Disposal Facility, San Bernardino County, California, W.F. Hardt & Associates, December 1987.


FORT IRWIN 24 MI.
BAKER 35 MI.
117°00'
45'
30'
50
51
52
53
54
55
56
MOJAVE VALLEY
MARINE CORPS SUPPLY CENTER (YERMO AREA)
MARINE CORPS SUPPLY CENTER (DAGGETT AREA)
US MC SUPPLY CENTER (NEBO AREA)
Barstow
Daggett
Yermo
Toomey
Harvard
Manix
Ranch
Mojave River
4 LANES DUAL
Power line
Lower
Barstow-Daggett 1927
ATCHISON TOPEKA AND SANTA FE
Newberry Springs
Hector
Poe
Lava
Substation
Private Road (power line)
Vector Mines
Pisgah Crater
Lavic
Silver Bell Mine
Indian Burial Ground
LAVA
Kane Wash
Old Woman Springs Road
Sunshine Peak
Argos Mountain
Mountains
Ord Mountains
Ord Ridge
Stoddard Wash
Stoddard Ridge
North Lucerne Valley
Mountain
Lucerne Valley
Calico Peak
Tiou Lane
Water line
Water tank
Substation
Private Road (power line)
Private Road
Mountains
Lava
Lava
Lava

State of California
GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814

89 NOV 28 PM 1:27

GEORGE DEUKMEJIAN
GOVERNOR

November 22, 1989

Mr. Paul Kiehold
San Bernardino County
Hazardous Materials Management
385 North Arrowhead Avenue, 3rd Floor
San Bernardino, CA 92415-0182

Dear Mr. Kiehold:

According to Health and Safety Code Section 25199.7(e), San Bernardino County Land Management Department has notified the Office of Permit Assistance (OPA) that an application for a General Plan Amendment and a Conditional Use Permit submitted by the Hidden Valley Resources for a specified hazardous waste management facility, a residual repository, has been deemed complete. Accordingly OPA shall convene a "post-application" scoping meeting for the project. The purpose of the meeting is to determine the issues which concern the agencies that are required to approve the project and the issues which concern the public.

A pre-scoping meeting for all responsible agencies has been scheduled for:

Wednesday, December 13, 1989
San Bernardino County
North Desert Region
Land Management Building
Planning Conference Room
15505 Civic Drive
Victorville, CA 92392
1:00 p.m. - 3:00 p.m.

A public scoping meeting for the project has been scheduled for:

Wednesday, December 13, 1989
Newberry Springs Community Services District
Community Room
30800 Newberry Road
Newberry Springs, CA
6:30 p.m.

Your attendance and participation in these scheduled meetings is imperative to continue the process required under the Tanner legislation (AB 2948). Please contact Christine Kinne at (916) 322-4245 to confirm the arrangements. An agenda for the afternoon meeting is attached for your review.

Sincerely,

Christine Kinne

for David C. Nunenkamp
Deputy Director, Permit Assistance

DCN:CK:pd

attachment

State of California

GOVERNOR'S OFFICE

OFFICE OF PLANNING AND RESEARCH

1400 TENTH STREET

SACRAMENTO 95814

89 NOV 28 PM 1:27

GEORGE DEUKMEJIAN

GOVERNOR

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San Bernardino County
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385 North Arrowhead Avenue, 3rd Floor
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Sincerely,

Christine Kinne

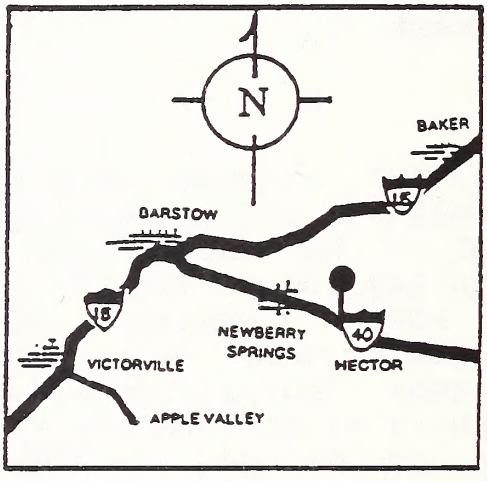
for David C. Nunenkamp
Deputy Director, Permit Assistance

DCN:CK:pd

attachment

NOTICE OF PREPARATION OF ENVIRONMENTAL IMPACT REPORT (EIR) AND PUBLIC SCOPING MEETING for Hazardous Waste Repository

The San Bernardino County Office of Planning has received an application from HVR, Incorporated to site a Hazardous Waste Repository in Hidden Valley. State law requires the Office of Permit Assistance to convene a "post-application" meeting of affected agencies and the public. The meeting will be used to determine issues of concern to the agencies and the public, and to determine the scope of the EIR. Environmental concerns can be expressed at this meeting or in writing.



NEWBERRY SPRINGS COMMUNITY BUILDING

30884 NEWBERRY ROAD, NEWBERRY SPRINGS

WEDNESDAY, DECEMBER 13, 1989

6:30 P.M.

QUESTIONS OR CONCERNS REGARDING THIS PROJECT CAN BE ADDRESSED TO: San Bernardino County Office of Planning

1853

County of San Bernardino

Paul Kielhold
385 N. Arrowhead Avenue
San Bernardino, CA 92415-0182
(714) 387-4146

Martha Sanera
15505 Civic Drive
Victorville, CA 92392
(619) 243-8245

Notice of Preparation

Appendix J

To: State Clearinghouse
(Agency)
1400 Tenth Street
(Address)
Sacramento, CA 95814

Subject: Notice of Preparation of a Draft Environmental Impact Report

Lead Agency: San Bernardino County

Agency Name Office of Planning

Street Address 385 N. Arrowhead Ave.

City/State/Zip San Bernardino, CA 92415-0182

Contact Paul Kielhold

Consulting Firm (if applicable):

Firm Name

Street Address

City/State/Zip

Contact

San Bernardino County will be the Lead Agency and will prepare an environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study (☒ is ☐ is not) attached.

Ten Copies

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but *not later than 30 days* after receipt of this notice.

Please send your response to Paul Kielhold at the address shown above. We will need the name for a contact person in your agency.

Project Title: Hidden Valley Resources, Inc., Hazardous Waste Repository

Project Location: Newberry Springs, (City (nearest)) San Bernardino (County)

Project Description: (brief)

The project is a General Plan Amendment and Conditional Use Permit to site a Hazardous Waste Repository in Hidden Valley (Cady mountains), 15 miles NE of Newberry Springs

Date 6 December 89

Signature Paul Kielhold

Title Planner

Telephone (714) 387-4146

Reference: California Administrative Code, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

Revised October 1989

Notice of Completion

Appendix F

Mail to: State Clearinghouse, 1400 Tenth Street, Sacramento, CA 95814 916/445-0613

See NOTE below

SCH # _____

Project Title: Hidden Valley Resources, Inc., Hazardous Waste Repository

Lead Agency: San Bernardino County — Contact Person: Paul Kielhold

Street Address: 385 N. Arrowhead Ave. — Phone: (714) 387-4146

City: San Bernardino CA — Zip: 92415-0182 — County: San Bernardino

Project Location

County: San Bernardino — City/Nearest Community: Newberry Springs

Cross Streets: Cady Mountains — Total Acres: 11,500

Assessor's Parcel No. _____ — Section: _____ — Twp. _____ — Range: _____ — Base: _____

Within 2 Miles: State Hwy #: _____ — Waterways: _____

Airports: _____ — Railways: _____ — Schools: _____

Document Type

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent ☐ EIR (Prior SCH No.) _____ ☐ Other _____

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☒ Joint Document ☐ Final Document ☐ Other _____

Local Action Type

☐ General Plan Update ☒ General Plan Amendment ☐ General Plan Element ☐ Community Plan

☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan

☐ Rezone ☐ Prezone ☒ Use Permit ☐ Land Division (Subdivision, Parcel Map, Tract Map, etc.)

☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☐ Other _____

Development Type

☐ Residential: *Units* _____ *Acres* _____

☐ Office: *Sq.ft.* _____ *Acres* _____ *Employees* _____

☐ Commercial: *Sq.ft.* _____ *Acres* _____ *Employees* _____

☐ Industrial: *Sq.ft.* _____ *Acres* _____ *Employees* _____

☐ Educational _____

☐ Recreational _____

☐ Water Facilities: *Type* _____ *MGD* _____

☐ Transportation: *Type* _____

☐ Mining: *Mineral* _____

☐ Power: *Type* _____ *Watts* _____

☐ Waste Treatment: *Type* _____

☒ Hazardous Waste: *Type* Repository

☐ Other: _____

Project Issues Discussed in Document

☒ Aesthetic/Visual
☐ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☐ Coastal Zone
☐ Drainage/Absorption
☐ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☐ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☐ Population/Housing Balance
☐ Public Services/Facilities
☒ Recreation/Parks
☐ Schools/Universities
☐ Septic Systems
☐ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☐ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☐ Wetland/Riparian
☒ Wildlife
☐ Growth Inducing
☒ Landuse
☒ Cumulative Effects
☒ Other Avian Safety

Present Land Use/Zoning/General Plan Use Current land use is vacant open space, land use designation is Resource Conservation.

Project Description The project is a General Plan Amendment and Conditional Use Permit to site a Hazardous Waste Repository in Hidden Valley (Cady mountains), 15 miles NE of Newberry Springs.

NOTE: Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. from a Notice of Preparation or previous draft document) please fill it in.

Revised October 1989

OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO, CA 95814

89 DEC 14 AM 10:21

DATE: December 11, 1989

TO: Reviewing Agencies

RE: San Bernardino County
Hidden Valley Resources, Inc. Hazardous Waste Repository's NOP for
SCH#89020219

Attached for your comment is the San Bernardino County's Notice of Preparation of a draft Environmental Impact Report (EIR) for the Hidden Valley Resources, Inc., Hazardous Waste Repository project.

Responsible agencies must transmit their concerns and comments on the scope and content of the EIR, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of this notice. We encourage commenting agencies to respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Paul Kielhold
San Bernardino County
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0182

with a copy to the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the review process, call John Keene at (916) 445-0613.
Sincerely,

David C. Nunenkamp
Deputy Director, Permit Assistance

Attachments

cc: Paul Kielhold

SCH#: 89020219

'S': Sent by Lead 'X': Sent by SCH

[X] Rob Fletcher
Air Resources Board
1102 Q Street
Sacramento, CA 95814
916/322-8267

[ ] Karen Cagle
Dept. of Boating & Waterways
1629 S Street
Sacramento, CA 95814
916/445-6281

[ ] Gary L. Holloway
California Coastal Commission
631 Howard Street, 4th Floor
San Francisco, CA 94105
415/543-8555

[ ] Terry Maderos
California Energy Commission
1516 Ninth Street, Rm. 200
Sacramento, CA 95814
916/324-3227

[ ] Sandy Hesnard
Caltrans - Division of Aeronautics
P.O. Box 942874
Sacramento, CA 94274-0001
916/324-1833

[X] George Smith
Caltrans - Planning
P.O. Box 942874
Sacramento, CA 94274-0001
916/445-5570

[X] Dennis O'Bryant
Dept. of Conservation
1416 Ninth Street, Room 1326-2
Sacramento, CA 95814
916/322-3873

[ ] Div. of Mines and Geology
[ ] Div. of Oil and Gas
[ ] Land Resources Protect. Unit

[ ] Vashek Cervinka
Dept. of Food and Agriculture
1220 N Street, Room 104
Sacramento, CA 95814
916/322-5227

[ ] Douglas Wickizer
Dept. of Forestry
1416 Ninth Street, Room 1516-2
Sacramento, CA 95814
916/322-0128

[ ] Robert Sleppy
Dept. of General Services
400 P Street, Suite 3460
Sacramento, CA 95814
916/324-0214

[X] Arlene Chance
Dept. of Health
714 P Street, Room 1253
Sacramento, CA 95814
916/323-6111

[X] Sgt. Jim Weddell
California Highway Patrol
Long Range Planning Section
Planning and Analysis Division
2555 First Avenue
Sacramento, CA 95818
916/445-1981

[X] William A. Johnson
Native American Heritage Comm.
915 Capitol Mall, Room 288
Sacramento, CA 95814
916/322-7791

[ ] Hans Kreutzberg
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001
916/322-9621

[X] Mike Doyle
Dept. of Parks and Recreation
P.O. Box 942896
Sacramento, CA 94296-0001
916/324-6421

[ ] George Hersh
Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
415/557-1375 (8-597)

[ ] Anna Leena Bronson
Reclamation Board
1416 Ninth Street Room 706
Sacramento, CA 95814
916/322-3740

[ ] Norris Millikan
S.F. Bay Conservation & Dev't. Comm.
30 Van Ness Avenue, Room 2011
San Francisco, CA 94102
415/557-3686

[X] Jeannie Blakeslee
Calif. Waste Management Board
1020 Ninth Street, Room 300
Sacramento, CA 95814
916/327-0454

[X] Ted Fukushima
State Lands Commission
1807 - 13th Street
Sacramento, CA 95814
916/322-7813

[X] Nadell Gayou
Dept. of Water Resource
1416 Ninth Street, Room 215-4
Sacramento, CA 95814
916/445-7416

[ ] Reed Holderman
State Coastal Conservancy
1330 Broadway, Suite 1100
Oakland, CA 94612
415/464-1015

[ ] DHS/TSCD: _____

[ ] _____

[ ] _____

Department of Transportation
District Contacts

[ ] Jo Sanford
Caltrans, *District 1*
1656 Union Street
Eureka, CA 95501
707/445-6671 (8-538)

[ ] Michelle Gallagher
Caltrans, *District 2*
1657 Riverside Drive
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916/225-3259 (8-442)

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703 B Street
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916/741-4277 (8-457)

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415/557-9162 (8-597)

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805/549-3161 (8-629)

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P.O. Box 12616
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209/276-5989 (8-422)

[ ] Gary McSweeney
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120 South Spring Street
Los Angeles, CA 90012
213/620-2376 (8-640)

[X] Harvey Sawyer
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247 West Third Street
San Bernardino, CA 92403
714/383-4808 (8-670)

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Caltrans, *District 9*
500 South Main Street
Bishop, CA 94514
619/872-0693 (8-621)

[ ] Al Johnson
Caltrans, *District 10*
P.O. Box 2048
Stockton, CA 95201
209/948-7838 (8-423)

[ ] Jim Cheshire
Caltrans, *District 11*
P.O. Box 85406
2829 Juan Street
San Diego, CA 92138-5406
619/237-6755 (8-631)

[ ] Robert Joseph
Caltrans, *District 12*
2501 Pullman St.
Santa Ana, CA 92705
714/724-2061 (8-655)

Fish and Game - *Regional Offices*

[ ] Gary Stacey, Regional Manager
Department of Fish and Game
601 Locust
Redding, CA 96001
916/225-2300 (8-442)

[ ] Jim Messersmith, Regional Manager
Department of Fish & Game
1701 Nimbus Road, Suite A
Rancho Cordova, CA 95670
916/355-0922 (8-438)

[ ] B. Hunter, Regional Manager
Department of Fish and Game
P.O. Box 47
Yountville, CA 94599
707/944-5518

[ ] G. Nakao, Regional Manager
Department of Fish and Game
1234 East Shaw Avenue
Fresno, CA 93710
209/222-3761 (8-421)

[X] Fred A. Worthley, Jr., Reg. Manager
Department of Fish and Game
330 Golden Shore, Suite 50
Long Beach, CA 90802
213/590-5113 (8-635)

[ ] Rolf E. Mall
Marine Resources Region
330 Golden Shore, Suite 50
Long Beach, CA 90802
213/590-5155 (8-635)

State Water Resources Control Board

[ ] Allan Patton
State Water Resources Control Board
Division of Loans & Grants
P.O. Box 944212
Sacramento, CA 94244-2120
916/739-4414

[X] Ed Anton
State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95801
916/445-9552

[ ] Dave Beringer
State Water Resources Control Board
Delta Unit
P.O. Box 2000
Sacramento, CA 95810
916/322-9870

[ ] Mike Falkenstein
State Water Resources Control Board
Division of Water Rights
901 P Street
Sacramento, CA 95814
916/324-5636

[ ] OTHER: _____

_____

_____

Regional Water Quality Control Board

[ ] NORTH COAST REGION (1)
1440 Guerneville Rd.
Santa Rosa, CA 95401
707/576-2220 (8-590)

[ ] SAN FRANCISCO BAY REGION (2)
1111 Jackson Street, Room 6000
Oakland, CA 94607
415/464-1255 (8-561)

[ ] CENTRAL COAST REGION (3)
1102-A Laurel Lane
San Luis Obispo, CA 93401
805/549-3147 (8-629)

[ ] LOS ANGELES REGION (4)
101 Center Plaza Drive
Monterey Park, CA 91754
213/620-4460 (8-640)

[ ] CENTRAL VALLEY REGION (5)
3443 Routier Road, Suite A
Sacramento, CA 95827-3098
916/361-5600

( ) Fresno Branch Office
3374 East Shields Avenue, Room 18
Fresno, CA 93726
209/445-5116 (8-421)

( ) Redding Branch Office
100 East Cypress Avenue
Redding, CA 96002
916/225-2045 (8-442)

[ ] LAHONTAN REGION (6)
2092 Lake Tahoe Boulevard
P.O. Box 9428
South Lake Tahoe, CA 95731
916/544-3481

(X) Victorville Branch Office
15428 Civic Drive, Suite 100
Victorville, CA 92392-2359
619/241-6583

[ ] COLORADO RIVER BASIN REGION (7)
73-271 Highway 111, Suite 21
Palm Desert, CA 92260
619/346-7491

[ ] SANTA ANA REGION (8)
6809 Indiana Avenue, Suite 200
Riverside, CA 92506
714/782-4130 (8-632)

[ ] SAN DIEGO REGION (9)
9771 Clairemont Mesa Blvd., Suite B
San Diego, CA 92124-1331
619/265-5114 (8-636)

APCD/AQMD: _____

[X] San Bernardino

_____

State of California
GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814

GEORGE DEUKMEJIAN
GOVERNOR

89 DEC 21 AM 9:45

December 15, 1989

Mr. Paul Kiehold
San Bernardino County
Hazardous Materials Management
385 North Arrowhead Avenue, 3rd Floor
San Bernardino, CA 92415-0182

Re: Post-Application Scoping Meeting for Hidden Valley Resources Residual Repository held December 13, 1989.

Dear Mr. Kiehold:

The Office of Permit Assistance (OPA) appreciates the cooperation and participation of your agency in the planning and executing of the above mentioned meeting. The attached lists contain sign-in sheets from the evening meeting and concerns expressed in this meeting.

Pursuant to Health and Safety Code §25199.4 OPA is available to coordinate and assist in any future meetings regarding the project. Technical assistance and coordination in the review and processing of all environmental documents and permit applications is imperative. If the Office can be of any further assistance please contact Christine Kinne at (916) 322-4245.

Sincerely,

David C. Nunenkamp
Deputy Director, Permit Assistance

DCN:CK:pd

enclosures

SIGN-IN SHEET
(Please print clearly)

OFFICE OF PERMIT ASSISTANCE

PROJECT NAME - _____

(This list will be used for notification of future meetings regarding this project)

Name	Address/Phone
1. P. Hazen	34271 Fort Cady Rd Newberry Sp
2. M Allen	29926 Fort Cady Rd Newberry Sp
3. KEITH CUMMINS	46089 OLD TRAILS HWY NEWBERRY SPRINGS
4. [illegible]	[illegible]
5. [illegible]	[illegible]
6. EDNA WATKINS	46766 MAGNEY LANE NEWBERRY SPRINGS
7. EDWARD WATKINS	46766 MAGNEY LANE - NEWBERRY SPRINGS
8. Jerry Davidson	44700 Rock Butte - Newberry Sp.
9. Kristy Davidson	44700 Rock Butte - Newberry Sp.
10. Lorraine Hazen	POB 15, Helendale, Ca 92342 619 245-4490
11. Lloyd Kaysen	44634 Black Butte C. 92365
12. Paul Kielhold	SBCO Planning
13. JIM WARREN	SCE
14. W. I Hayales	35207 Troy Rd Newberry Springs Ca 92365
15. Jack Harrison	75374 Twin Lakes Newberry Springs CA 92365 - 257 3952
16. Betty C. Wack	32824 Mt View Newberry Spring Ca 92365/619 2573931
17. Annette [illegible]	46361 Fairview Newberry Springs CA 92365 (619) 257-3651
18. Stan L. [illegible]	46361 Fairview Newberry Springs, CA 92365 619 257-3651
19. Bill [illegible]	45715 Thos Veneles Rd N.S 92365 257-34[illegible]
20. [illegible]	[illegible] Thos Veneles Rd N.S. 92365 257-34[illegible]

SIGN-IN SHEET
(Please print clearly)

OFFICE OF PERMIT ASSISTANCE

PROJECT NAME - Hidden Valley 12/13/89

(This list will be used for notification of future meetings regarding this project)

	Name	Address/Phone
1.	[illegible]	7716 Fairview 2573436
2.	[illegible]	[illegible]
3.	[illegible]	[illegible]
4.	[illegible]	[illegible]
5.	[illegible]	[illegible]
6.	[illegible]	[illegible]
7.	[illegible]	[illegible]
8.	[illegible]	[illegible]
9.	[illegible]	[illegible]
10.	[illegible]	[illegible]
11.	[illegible]	[illegible]
12.	[illegible]	[illegible]
13.	[illegible]	[illegible]
14.	[illegible]	[illegible]
15.	[illegible]	[illegible]
16.	[illegible]	[illegible]
17.	[illegible]	[illegible]
18.	[illegible]	[illegible]
19.	[illegible]	[illegible]
20.	[illegible]	[illegible]

SIGN-IN SHEET
(Please print clearly)

OFFICE OF PERMIT ASSISTANCE

PROJECT NAME - _____

(This list will be used for notification of future meetings regarding this project)

	Name	Address/Phone
1.	[illegible] Cadberry	43164 Lemming Rd N.B.S 257-3986
2.	C J McNeil	32152½ Pacific View NB —
3.	[illegible]	41585 Palma Vista N.B.S. 257-3740
4.	[illegible]	31254 Calle [illegible] N.B.S. 257-3247
5.	Robert Nunn	31330 Calle Lancha N.B.S 257-3530
6.	[illegible]	" " " "
7.	[illegible] Hall	321 Ent View Santaw Ca. 92311
8.	Len Smith	" " " " "
9.	Jack Patchett	[illegible] Blvd. Laguna
10.	H Edmondson	35205 [illegible] N.B.
11.	David Nunes	46643 Tower Rd Palm Beach
12.	Harold Berry	31296 Valley Center Rd Thousand Oaks Ca. 9236
13.	Hank Sim	" " " " "
14.	Pat Stanley	45269 Palma Vista N.B.
15.	[illegible]	[illegible] Martin Rd N.B.
16.	L Williams	45475 MARTIN Rd N.B.
17.	Barry Mac Rae	49064 Pinetree Dr N.B.
18.	[illegible]	N.B.
19.	Norman & Dee Hickman	[illegible] Irvine 92715
20.	[illegible]	43774 Cottonwood 92324 L.O

41167 [illegible] Palm Desert
45031 Pinetree Monterey

SIGN-IN SHEET
(Please print clearly)

OFFICE OF PERMIT ASSISTANCE

PROJECT NAME -

(This list will be used for notification of future meetings regarding this project)

	Name	Address/Phone
1.	Kent L. Collins	41615 Turner Rd. 257-3533
2.	DAN W DAVIS JR	HCR 10 BOX 106A ADELANTO CA. 92301
3.	ROBERT HARNIK	PO 273 32990 HARVARD NEWBERRY 92365
4.	TERRY PETIT	45680 SILVER VALLEY RD NEWBERRY SPRINGS, CA. 92365
5.		
6.	PETER BRIGHT	SBCo EHS-35 Arrowhead SB.
7.	OSCAR HELLRICH	SAN BDNO APCD 15428 CIVIC DR. VICTORVILLE 92392
8.	Ralph E. ORTH	34284 ORTON DR. N.R.S. CA. 92365
9.	IRWIN & LYLLAC	SPITZER 306 MARCIA ST REDLANDS 923
10.	Martin Lanin	SBCO Planning
11.	Jim Bennett	DEHS 387-4692
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

POST-APPLICATION MEETING
HIDDEN VALLEY RESOURCES
NEWBERRY SPRINGS, CA

Wednesday, December 13, 1989

Audience Questions And Comments

The questions and comments listed below were taken as notes at the meeting of December 13, 1989. These are meant to be indicative of the concerns expressed at the meeting and issues which may need to be addressed. The following are not meant to be verbatim notes, minutes, or testimony. The comments may cover a broad area which often exceeds thoses issues which are usually the focus at an environmental scoping session. However so as to provide a more complete background and understanding of the audience questions and attitudes all statements have been included nevertheless. An attempt has been made to try and organize the comments by group whether by speaker or subject. Applicants are encouraged to review the comments as to their project, agencies as to their responsibilities, and the public as to their concerns.

Questions and Comments:

County Hazardous Waste Management Plan
- How can the Post-Application Meeting be held since the CoHWMP is not approved by the State?
- How can this project therefore be analyzed without an approved plan?

Need For A Comprehensive Desert Plan That Addresses:
- Hazardous Wastes
- Migratory Sheep Trails
- Seismic Hazards

Relationship of Project to Adjacent Land Uses
- Fort Irwin and activities such as wargames
- Farmers
- Ironwood Camp/School
- School is Silver Valley and not Silver Lake.
- Was only 200 homes now over 1200.
- How will project affect land values?
- Will the project be growth inducing?

Resource Conservation Recovery Act (RCRA)
- Will project comply with this law and what are its impacts in relationship to it.?

Concern With Project Impacts In Regard To Report By The Department of Water Resources:

- Report Title, "Bulletin 91-10
  Well and Springs In The Lower Mojave Area,
  San Bernardino County
  By: US Department of the Interior
  Geological Survey
  December 1963
- Concerns include impacts regarding faults, impacts on water basin, water conditions as to where and how much.

Core Samples

- To Bedrock?
- Why well abandoned?
- Integrity?

Endangered Species

- Desert Tortoise
- Big Horn Sheep
  - Habitat
  - Guzzlers
  - Migration and Water Sources

Geology of Area

- Severe Faults
- Need solid Info
- Core samples and facts
- A New Seismic Study needed before project approval

Research on New Faults

- Ludlow Fault
- Further Research
- Ludlow goes through site?

The Community Service District has petition and is on record as being against this project.

Transportation

- How will substances be transported?
- Transferred once on site?
- Illegal dumping by haulers?
- What of Roads?
  - Hector to site?
  - Affect the Public?
- Protection from spillage?
- Size of trucks
  - Manifests
  - Safe operations
  - monitoring
- Right of Way Acquisition?
- Railroad Spur, credibility?

Air Impacts
- Emissions from transfer and transportation to site
- Evaporation
  - where does it go?

Flooding Problems
- Wash goes down to lower desert
- How will it be protected from deluge and flooding?
- Troy Dry Lake averages 4" annual rain sometimes as much as 40"
- Even in average years 3" of the 4" will fall often all at once

Have a Test Construction to See How It Stands Up.

Who Watches the Agencies, Who are watching the applicants?

Can The Original Applicant Sell, Transfer, or Convey to Another Owner?

Future Expansion
- Increased levels?
- New Materials beyond original application?
- Cumulative Impacts?
- Types of Waste?
- What is Maximum Capacity?

Hydrology
- What will prevent migration of contaminated groundwater?
- Why was the well destroyed?
- Newberry receives 8" rain annually is there a parallel to this site in as much as the applicants state only 4" inches average rainfall annually.
- USGS has 3 criteria for siting.

Faults
- Applicants state only 3 faults but 94 identified within 20 mile radius.

U. S. Ecology Rejected Site
- Potential shallow bedrock
- Potential shallow groundwater
- faults

Need to look at variable conditions and the worst case scenario.

Recycling Issues
- Alternative Technologies must be considered.
- What are limiting factors?
- Why isn't recycling used for these materials?
- Check on feasible on-site recycling so material doesn't have to be brought here.
- Why locate here and not where its generated?

Radioactive Deposits
- Natural deposits in vicinity
- Impacts in alluvium, deposits, dust, etc.

Financial Assurances
- Responsibility of stockholders?
- Who will build and then maintain the new roads?
- Assurances for closure clean-up
- Bonds, financial abilities,
  - how, when etc.
  - for spills, closure etc.
- When will community be provided with list of financial backing?
  - (provide the CSD with answer?)
- How will 10% be allocated?
  - regionally or to the local community?
- Experience of applicants as opposed to other firms such as BKK.
- Audit of company
- Why two companies?
  - Hidden Valley and Patrick Henderson?

Local Assessment Committee
- Who makes up the committee?
- Terms and conditions of approval
  - where, who, how much

Risk of Upset
- Toxic gases if wet?
  - emergency response
- How would accidents affect schools, transportation, etc.?
- How do we keep children away from trucks hauling hazardous wastes?
- How will public be protected from spillage and illegal dumping?

Public Land Issues
- How Much Land in Private Vs. Public Ownership?
- Why Off Road Vehicles illegal but this project allowable?
- BLM Land Use Policies?
- Knowledge of Public Lands?
- Bills in Congress to make a Wilderness Area.
- Desert Protection Act
- How will public lands be affected?

Storage Structures
- effect of materials on storage structures.
- corrosion of concrete and steel?
  - from pressure
  - depth
  - heavy metals
- seismic effects

Interagency Coordination
- State and County agencies not addressing issues
- Who represents area on the Local Assessment Committee?
- Agencies should be pro-active and not force local communities to be reactive.
- If Mojave county created, what will be future of the project?
- What is area's "fairshare"?

LAND MANAGEMENT DEPARTMENT

385 North Arrowhead Avenue • San Bernardino, CA 92415-0180 • (714) 387-4091

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

JOHN N. JAQUESS
Land Management Director

OFFICE OF PLANNING
Sharon W. Hightower
County Planning Officer

OFFICE OF SURVEYOR
Claude D. Tomlinson, L.S.
County Surveyor

OFFICE OF BUILDING AND SAFETY
Larry L. Schoelkopf, P.E.
County Building Official

PUBLIC SCOPING MEETING

HIDDEN VALLEY RESOURCES, INC.

HAZARDOUS WASTE RESIDUAL REPOSITORY

Newberry Springs Community Building

December 13, 1989 at 6:30 p.m.

Local Land Use Permit Process

1) Proponent has submitted an application to the County for a General Plan Amendment and a Condional Use Permit.

2) The County will determine the scope of the Environmental Impact Report (EIR) through the use of an Initial Study and Public Scoping Meeting.

3) The County contracts a consultant to prepare the EIR.

4) Consultant prepares a Draft EIR.

5) Draft EIR circulates for a 45-day public review period.

6) Environmental Review Committee meets to review adequacy of the Draft EIR.

7) Consultant prepares Final EIR including comments from agencies and the public, and responses to those comments.

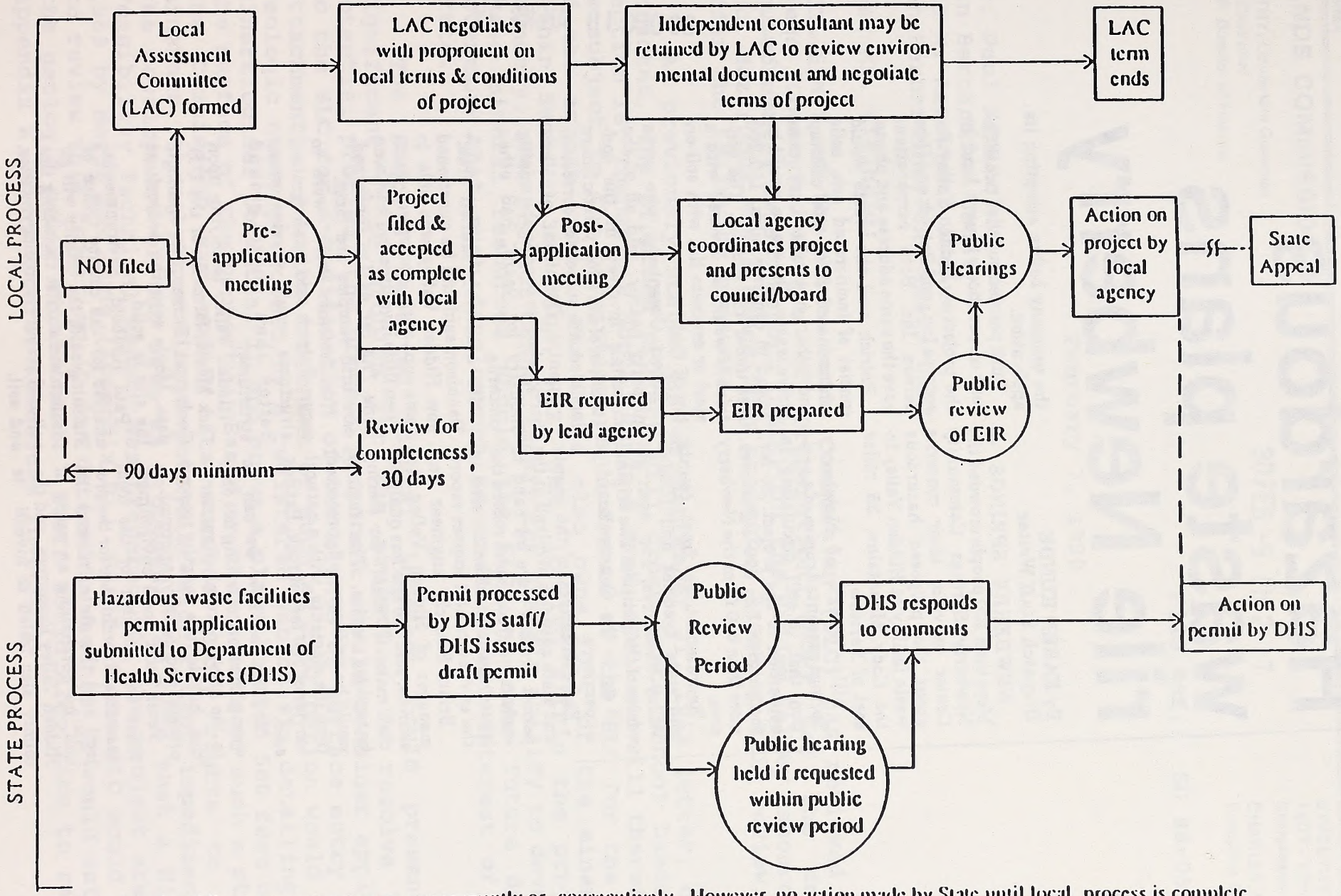
8) Planning Commission holds public hearing to take testimony and make a recommendation to the Board of Supervisors.

9) Board of Supervisors holds public hearing to take testimony and take an action on the applications.

HVR.PUB.INFO

FIGURE 5-1

SPECIFIED HAZARDOUS WASTE FACILITY DECISION FLOW CHART



Note: Local and State processes may run concurrently or consecutively. However, no action made by State until local process is complete.

Desert Dispatch, Thursday, Dec. 14, 1989

Hazardous waste plans rile Newberry

By KAREN KUNDE
Dispatch Staff Writer

NEWBERRY SPRINGS — More than 100 people crowded the Newberry Springs Community Center to voice their concerns about the proposed hazardous waste facility at Hidden Valley in the Cady Mountains, 35 miles east of Barstow.

Billy Weeks of Newberry Springs presented copies of a petition that is still circulating in opposition to the project. So far, the petition has 699 signatures, more than 500 from the Newberry area.

Representatives from county and state agencies and Hidden Valley Resources, Inc. each got copies of the petition. The original will go to the County Board of Supervisors.

Representatives of the county and state agencies involved in the permit process were on hand to explain the process and record the issues that should be covered in the environmental impact report.

Brian Patrick, engineer and manager of Hidden Valley Resources, said the site has qualities that make it "ideal" for storing hazardous waste. The facility would be underground, protected from the elements, with a natural barrier of 500 feet of rock, Patrick said.

"I don't see how we can go wrong," he said, referring not only to the site's natural characteristics, but to the lengthy permit process and agency approval.

Peter Burk, local environmentalist and member of the local assessment committee for the project, said the state "missed the ball" by not having an audit of Hidden Valley Resources, and the county also failed to investi te the company before accepting its application.

Burk pointed out that two different corporations bought land for the project — Hidden Valley Resources Inc., and Patrick and Henderson Inc. Both corporations have the same address and phone.

Patrick said the waste would consist of incinerated ash, soils contaminated from site cleanup and other neutralized, or non-active waste. The waste would be stored in concrete silos, 150-200 feet under the ground. The containers would be covered with a steel or concrete lid, with soil on top of that.

Robert Greenberg, who owns property nearby, said all of the materials involved in the construction of the silos, plastic liners included, are subject to corrosion.

Quentin Dennison, of Newberry, who has been in the mining industry for years, had other concerns.

"It's a severely faulted area," Dennison said and he questioned how Hidden Valley was able to come up with geological facts when little investigation had been done. "As far as I'm concerned, core drill samples are facts."

If a "seismic event" were to occur, Patrick said, underground structures would survive much better than above ground structures.

Hidden Valley is relying upon Dick Moyle, formerly of the U.S. Geological Survey, for geologic data. Moyle says the bedrock at the site is solid.

Paul Kielhold, environmental analyst for the county Office of Planning said, the county will go through a checklist including the cultural resources, biology, water and soil.

89 DEC 18 AM 10:39

FROM SUE GOODRICH
SECRETARY TO
SUPERVISOR TUROCI

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
JESSE R. HUFF, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, CA 95814
CHARLES WARREN
Executive Officer

90 FEB -9 PM 2:17

File Ref.: SD 88-08-08

February 7, 1990

Mr. Paul Kielhold
San Bernardino County
385 N. Arrowhead Avenue
San Bernardino, CA 92415-0182

Dear Mr. Kielhold:

Staff of the State Lands Commission (SLC) has reviewed San Diego County's Notice of Preparation (NOP) for the draft Environmental Impact Report (DEIR) for the Hidden Valley Resources, Inc. Hazardous Waste Repository project. Based on this review, we offer the following comments.

As previously stated in our September 21, 1988 letter, copy attached, the proposed project will cross State School Lands in Section 16, Township 9 North, Range 5 East, SBM, and will therefore be subject to the permitting requirements of the SLC for the use of the access road. The State also owns 100% of the minerals within Section 36, T10N, R5E, SBM, located within the project boundary. The project cannot impair the State's ability to develop these mineral resources should the SLC, at some future date, determine that such development is in the best interest of the State.

The State's reserved mineral interest could present a significant title problem for the project. To resolve this potential problem, the project proponent should consider applying to the SLC for a modification of its rights of surface entry (see attachment). A major component of such an application would be a geologic study performed by a registered geologist, detailing the mineralogical potential in and above a plane located 500 feet below the surface of the property. Based on the results of such a study, the Commission may modify its surface entry rights to such minerals, thereby removing a potential significant impediment to the development of the site as proposed. We note that a Mining Feasibility Technical Report was prepared for the project area in 1989 by Moyle and June (Appendix P). Staff of the SLC would like to review this report so it can determine whether it would satisfy the geologic study requirement. Staff would also like to review Appendix K, the Cultural Resources Inventory.

The NOP appears to address the areas required by the California Environmental Quality Act (CEQA). The EIR should also include the following:

a) An inventory and characterization of known hazardous wastes which are to be disposed at this facility including quantity, point(s) of origin, and means of transportation to the facility. We would also like to see a description of how such wastes are currently managed;

b) Proposed siting criteria for any future or alternate facilities and an evaluation of their environmental consequences on land, water and air resources, especially sensitive habitat areas;

c) "Impact significance criteria" for assessing the level of significance for designated impacts which could then be used to determine feasible mitigations; and

d) The need for, and characteristics of buffer zones to specific components of the project facilities.

We appreciate the opportunity to comment and look forward to review of the draft document. If you have any questions regarding SLC leasing, please contact Al Willard at (213) 590-5207. If you have any questions regarding content of the DEIR, please contact Dan Gorfain (916) 322-7829 or Betty Eubanks (916) 322-2795.

Sincerely,

Dwight E. Sanders

DWIGHT E. SANDERS, Chief
Division of Research
and Planning

DES:maa
Attachments
cc: Charles Warren, Executive Officer
Al Willard
Dan Gorfain
Betty Eubanks

STATE OF CALIFORNIA

GEORGE DEUKMEJIAN, *Governor*

STATE LANDS COMMISSION

LEO T. McCARTHY, *Lieutenant Governor*
GRAY DAVIS, *Controller*
JESSE R. HUFF, *Director of Finance*

EXECUTIVE OFFICE
1807 - 13th Street
Sacramento, California 95814

CLAIRE T. DEDRICK
Executive Officer

SD 88-08-08

September 21, 1988

Ms. Christine Kinne
Assistant Chief
Office of Permit Assistance
1400 Tenth Street
Sacramento, CA 95814

Dear Ms. Kinne:

Staff of the State Lands Commission (SLC) has reviewed the Notice of Intent to Apply for a Specified Hazardous Waste Facility Project Land Use Decision (Hector Residual Repository - SCH. No. 88072250) under, Health and Safety Code, Section 25199.7(a) and offer the following comment.

The proposed project, as described, will cross State School Lands in Section 16, Township 9 North, Range 5 East, SBM, and will therefore need to apply for a lease from the State Lands Commission for the use of the access road. Additionally, the State owns 100% of the minerals within Section 36 in Township 10 North, Range 5 East, SBM, located within the project boundary. The project must not impair the State's ability to develop these mineral resources should the Commission, at some future date, determine that such development is in the best interest of the State. This circumstance should be considered in the evaluation process for the site.

In light of the above, we would like to be apprised of any public meetings and/or draft documents associated with this project. If you have any questions or desire clarification on any of the above points, please contact Betty Eubanks of our office at (916) 322-2795.

Thank you for the opportunity to comment.

Sincerely,

ORIGINAL SIGNED BY DWIGHT E. SANDERS

DWIGHT E. SANDERS, Chief
Division of Research
and Planning

DES:maa
cc: Claire T. Dedrick, Executive Officer
James F. Trout, Assistant Executive Officer
Lance Kiley, Chief, Division of Land Management and Conservation
Betty Eubanks
Alan Hendersen, Hidden Valley Resources, Inc.
bcc: Jeff Fong
Dan Gorfain
2562S

REQUIREMENT FOR APPLICATION FOR MODIFICATION OF RIGHT OF SURFACE ENTRY

(Form 33.43-4/78)

Surface owners of lands subject to a mineral reservation in the State of California who request, pursuant to Public Resources Code Section 6401(b), the State to modify the rights of the State to the use of the surface and right of entry to a depth of 500' below the surface of such lands shall submit the following information.

1) A certified statement from the county tax assessor's office, to which taxes for said parcels are paid, naming the present owners of said parcel.

2) PURPOSE OF REQUEST FOR RELINQUISHMENT OF SURFACE ENTRY.

   a. When subject parcel is being developed or is part of a proposed development, the applicant shall file with the Commission three sets of general plans of the proposed development. The content of the plan may vary according to the type of development contemplated, but each should contain a narrative description of the proposed development. They should include subdivision maps, building plans, etc., and proposed development reports, wherever they are sufficiently detailed to apprise the Commission of any possible environmental impact the proposed development might have.

3) DESCRIPTION OF THE GENERAL VICINITY (10-MILE RADIUS), WITH EMPHASIS ON THE FOLLOWING:

   a. Land use; significant improvements and zoning, present and projected.

   b. Population density.

   c. Economic trends and development patterns.

   d. Landmarks; historical or archaeological values.

   e. Public recreation facilities in the vicinity.

f. Fish and wildlife; vegetation, soils, etc.; a general description of the present ecology of the vicinity.

4) DESCRIPTION (TOPOGRAPHICAL) AND PROPOSED USE OF SUBJECT STATE LAND, TO INCLUDE THE FOLLOWING:

a. Classification; e.g., school.

b. Existing structures or land improvements on the State land and their current use, including any income from their use.

c. Proposed construction, to include new structures, land improvements, or alterations to existing improvements, and use.

d. Beginning and completion dates for proposed project.

e. Copy of city or county building, variance, or use permit for all operations and structures, existing or proposed, on State land.

f. Plans and profiles of existing structures, proposed construction, such as, subdivision maps, building plans, etc.

g. Dated photographs showing all existing structures and appurtenances and the general area.

5) A GEOLOGICAL STUDY MADE BY A REGISTERED GEOLOGIST OF THE STATE OF CALIFORNIA. SUCH STUDY SHALL DETAIL THE MINERALOGICAL POTENTIAL IN AND ABOVE A PLANE, LOCATED 500' BELOW THE SURFACE OF PROPERTY, AND A WRITTEN REPORT SHALL BE SUBMITTED TO THE COMMISSION. AS PART OF SUCH STUDY, A SPECIFIC CORING PROGRAM AT SPACING AND TO SUCH DEPTH, AS THE COMMISSION DEEMS APPROPRIATE, MAY BE REQUIRED.

6) FEES:

a. $25.00 filing fee

b. $300.00 processing fee

Cross References:
Rejection or approval of application for leasing of lands under the provisions of the General Leasing Law within 90 days after completion of the environmental impact report required by this Section: § 6502.

§ 6372. Declaration of legislative intent: Grants not to be made pending Legislature's receipt of report

It is the intent of the Legislature that no further grants of state lands shall be made until the report required to be submitted by the commission pursuant to Section 6370 has been received by the Legislature.

Added Stats 1970 ch 1555 § 1.

§ 6373. General plan for use of lands: Submission by intended recipient

Before any disposition of state lands to a private party or other governmental agency, the intended recipient of such lands shall submit to the commission and to the Legislature a general plan, as specified by the commission, for the use of the subject lands to be transferred, together with the review and comments of other interested state agencies.

Added Stats 1970 ch 1555 § 1.

§§ 6374, 6375. [Added by Stats 1970 ch 1555 § a and repealed by stats 1975 ch 641 §§ 10, 11.]

Note—The repealed sections required the inventory of lands previously granted in trust to governmental agencies.

§ 6376. Inventories to be solely for informational purposes: Effect on rights of ownership

It is the intent of the Legislature that any inventory prepared pursuant to this chapter shall be solely for informational purposes and not to establish rights of ownership. Any boundaries mapped or described by the commission in any such inventory shall not be binding upon any upland owner or other party affected thereby.

Added Stats 1970 ch 1555 § 1.

§ 6377. Exceptions

The provisions of this chapter shall not apply to tidelands transferred pursuant to Chapter 1333 of the Statutes of 1968, to tidelands and submerged lands heretofore granted to the City of Long Beach or to oil revenues and dry gas revenues whose disposition is governed by Chapter 138 of the Statutes of 1964, First Extraordinary Session, or

to any sovereign or other state lands transferred to the City of Oakland in trust by the state for port purposes.

Added Stats 1970 ch 1555 § 1.

§ 6378. Salmon and steelhead spawning areas: Determination of ownership, protection, and limited disposal of material

The commission shall determine the ownership of all salmon and steelhead spawning areas as designated by Section 1505 of the Fish and Game Code. All areas found to be state property shall be permanently protected by the state, and no sale, lease or disposal of material shall be made as to such areas, except that rights-of-way and easements may be granted to, and leases entered into with, public utilities for the installation, operation, and maintenance of public utility facilities unless the Director of Fish and Game shall determine that such facilities would prove deleterious to fishlife.

Added Stats 1971 ch 1405 § 2.

CHAPTER 5

Reservation of Minerals

§ 6401. Mineral deposits reserved to state: Purchases subject to reservation: Liability of state authorized prospector: Mining and removal of deposits: Bond or undertaking for use and benefit of purchaser: Compromise agreements
§ 6402. Applications and sales of public lands subject to reservation of deposits and right to prospect: Grants to United States, etc.
§ 6403. Application of chapter
§ 6404. Sale of listed lands: Disposal of mineral deposits
§ 6405. Responsibility for and jurisdiction over disposition of mineral reservations: Rental or lease
§ 6406. Sale, etc., of mineral reservations made prior to effective date of § 6403
§ 6407. Purpose of enactment of section: Effect: What mineral deposits include

Cross References:
State property: CC § 670; Gov C §§ 14660 et seq.
Rights of state over property: Gov C §§ 180 et seq.

Collateral References:
Witkin Summary (8th ed) p 1798.

§ 6401. Mineral deposits reserved to state: Purchases subject to reservation: Liability of state authorized prospector: Mining and removal of deposits: Bond or undertaking for use and benefit of purchaser: Compromise agreements

(a) All oil, gas, oil shale, coal, phosphate, sodium, gold, silver, and all other mineral deposits in public lands belonging to the state, or which

may become the property of the state, are reserved to the state. Such deposits are reserved from sale except upon a rental and royalty basis and except as otherwise provided by law. A purchaser of any public lands belonging to the state, or which may become property of the state, shall acquire no right, title, or interest in or to such deposits. The right of such purchaser shall be subject to the reservation of all oil, gas, oil shale, coal, phosphate, sodium, gold, silver, and all other mineral deposits, and to the conditions and limitations prescribed by law providing for the state and persons authorized by it to prospect for, mine, and remove such deposits, and to occupy and use so much of the surface of the land as may be required for all purposes reasonably extending to the mining and removal of such deposits therefrom; provided, that when any person, authorized by the state to prospect for said reserved deposits to the extent provided for in this division, enters upon such land, such person so entering shall be liable to and shall compensate such purchaser of land for all damage and injury to the permanent improvements and the crops on such lands by reason of such prospecting; provided, further, that persons who have acquired the right to mine and remove such deposits may reenter, occupy and use so much of the surface of the land as may be required for all purposes reasonably extending to the mining and removal of such deposits therefrom; first, upon securing the written consent or waiver of the purchaser of such public land; second, upon payment of the damages to crops or other tangible improvements to the owner thereof, where agreement may be had as to the amount thereof; or third, in lieu of either of the foregoing provisions, upon the execution of a good and sufficient bond or undertaking to the State of California for the use and benefit of the purchaser of such land, to secure the payment of such damages to the crops or tangible improvements of the purchaser of said land as may be determined and fixed in an action brought upon the bond or undertaking in a court of competent jurisdiction against the principal and sureties thereon, such bond or undertaking to be in the form and in accordance with the rules and regulations prescribed by the commission; and provided, further, that the provisions of this section shall not apply to any compromise agreement entered into under this division, nor to any exchange of real property where the state receives the mineral rights in the parcel or parcels being acquired by the state.

(b) Notwithstanding subdivision (a), upon a finding by the commission that there are no known deposits of commercially valuable minerals in and above a plane located 500 feet below the surface of any lands sold or exchanged or to be sold or exchanged by the state to another, including land sold pursuant to Section 6404, and wherein any or all of the mineral deposits have been or are required by law to be reserved to the state, the commission may be quitclaim, patent, agreement, or other appropriate instrument, modify the accompanying

rights of the state to the use of the surface of such lands, including any right to enter such lands to a depth of 500 feet below the surface of such lands, as will permit the orderly use and development of all such sold or exchanged lands. Any such finding by the commission and any such modification of accompanying rights of the state as provided in this subdivision shall be conclusive in favor of any purchaser or encumbrancer of such sold or exchanged lands acting in good faith and for value. Any modification authorized by this subdivision which affects school land Sections 16 and 36 granted to the state by and upon the terms and conditions set forth in Section 870 of Title 43 of the United States Code, shall not be made in a manner inconsistent with the terms and conditions set forth in such federal law so long as such terms and conditions are effective. Nothing in this subdivision shall be construed to authorize the relinquishment of any mineral rights in such lands owned or reserved to the state.

Added Stats 1941 ch 548 § 1; Amended Stats 1947 ch 227 § 1; Stats 1961 ch 1651 § 1; Stats 1967 ch 698 § 1; Stats 1969 ch 1014 § 1.

Prior Law:

(a) Stats Ex Sess 1938 ch 5 § 31 p 25.

(b) Stats 1921 ch 303 § 1 p 404, as amended by Stats 1935 ch 848 § 1 p 2265.

Amendments:

1947 Amendment: Substituted the first sentence for the former first sentence which read: "All oil, gas, oil shale, coal, phosphate, sodium, gold, silver, and all other mineral deposits in lands belonging to the State, or which may become the property of the State, are reserved to the State, except that nothing in this chapter applies to lands acquired by the State on sale thereof for delinquent taxes, other than lands so acquired, the deed for which is required to be filed in the office of the Department of Finance or of the commission; and except that nothing in this chapter applies to lands acquired by the State under the provisions of the Streets and Highways Code and sold or exchanged pursuant to the provisions of Section 104.5 thereof"; (2) added "and except as otherwise provided by law" at the end of the second sentence; and (3) added "public" before "lands" in the third sentence.

1961 Amendment: Added (1) "oil," before "shale" in the first sentence; and (2) amended the fourth sentence by substituting all that between "removal of such deposits therefrom" and "provisions of this section" for ". The" almost at the end of the section.

1967 Amendment: Added ", nor to any exchange of real property where the state receives the mineral rights in the parcel or parcels being acquired by the state" at the end of the section.

1969 Amendment: (1) Designated the former section to be subd (a); and (2) added subd (b).

Cross References:

"Oil and gas": § 6004.

"Oil": § 3006; CCP § 349¾; H & N C § 133.

"Gas": § 3007; CCP § 349¾.

Authority of state to release the mineral rights in filled and reclaimed lands conveyed to it: § 6307.

Collateral References:

Cal Jur 2d Mines and Minerals §§ 141, 142, Oil and Gas §§ 229, 267, Public Lands §§ 61, 65.

Cal Digest of Official Reports 3d Series Mines and Minerals §§ 1 et seq; Public Lands §§ 1–4.

63 Am Jur 2d Public Lands §§ 108, 110, 112, 116.

Rights of the states to lands beneath navigable waters within state boundaries: 43 USCS §§ 1311 et seq.

Law Review Articles:

Reservation of mineral lands in school land grants. 36 CLR 386.

Reservation of mineral deposits in grants to railroads. 37 CLR 609.

Attorney General's Opinions:

1 Ops Atty Gen 232 (statute as requiring commission, in selling lands, to make reservation of minerals).

16 Ops Atty Gen 69 (what mineral rights are retained by the state in lands sold under the provisions of Stats 1921 ch 303).

NOTES OF DECISIONS

The reservation of minerals by Stats 1921 ch 303 § 1 was intended to apply only to the public domain which was subject to sale under statutes in existence at the time the Oil Leasing Act of 1921 was enacted. McNeil v Kingsbury (1923) 190 C 406, 213 P 50.

It is unnecessary for the state to reserve rights in land which it owns in fee and which is not subject to sale except by special authority of the Legislature; the necessity for the reservation of mineral rights in state land only exists with reference to those lands already authorized to be sold, and the purpose of such a reservation is to indicate the character of title that can be conveyed by the state officer authorized to execute such grant. McNeil v Kingsbury (1923) 190 C 406, 213 P 50.

Stats 1921 p 404, amended by Stats 1923 p 593, relating to granting of permits to prospect for oil, gas, etc., is valid exercise of right which inheres in state by virtue of its sovereign power, and does not impinge on state or federal constitutions and is not in conflict with any act of Congress or State of California. Boone v Kingsbury (1928) 206 C 148, 273 P 797, cert den 280 US 517, 74 L Ed 587, 50 S Ct 66.

One of purposes of legislature by enactment of Statutes and Amendments 1921, p 404, was to give to citizens opportunity to intercept large volumes of oil gravitating seaward to inextricable depths, and to reduce to usual purposes, oil, gas and mineral deposits reposing beneath ocean's bed. Boone v Kingsbury (1928) 206 C 148, 273 P 797, cert den 280 US 517, 74 L Ed 587, 50 S Ct 66.

Littoral owners who have not complied with provisions of Stats 1921 p 404, as amended by Stats 1923 p 593, have no such right by reason of littoral ownership as would defeat right of any other citizen who has complied with requirements of said act. Boone v Kingsbury (1928) 206 C 148, 273 P 797, cert den 280 US 517, 74 L Ed 587, 50 S Ct 66.

State is not owner of land and minerals therein lying off coast of California in three mile belt seaward from ordinary low-water mark. United States v California (1946) 332 US 19, 91 L Ed 1889, 67 S Ct 1658.

§ 6402. Applications and sales of public lands subject to reservation of deposits and right to prospect: Grants to United States, etc

All applications to purchase state public lands and all sales pursuant thereto shall be subject to and contain a reservation to the State of all oil, gas, oil shale, coal, phosphate, sodium, gold, silver, and all other mineral deposits in all lands so acquired, and shall also contain a reservation to the State, and persons authorized by it, of the right to prospect for, mine, and remove such deposits and to occupy and use so much of the surface as may be required therefor, and all certificates of purchase and patents issued therefor shall contain such reservations.

Whenever authorized by law to make grants of land to the United

States of America, or to an officer, department, or agency thereof, either in exchange for other lands or otherwise, the commission may make such grants with or without the reservation of deposits of oil and gas and other minerals required by this chapter.

Added Stats 1941 ch 548 § 1; Amended Stats 1947 ch 227 § 2.

Prior Law:

(a) Stats Ex Sess 1938 ch 5 § 32 p 26.

(b) Stats 1921 ch 303 § 2 p 404.

Amendments:

1947 Amendment: Added "public" after "All applications to purchase state" at the beginning of the section.

Cross References:

Lease of tidelands and submerged lands owned by city: CC § 718.

Tidelands not to pass into private hands: Const Art X § 3.

Grant of tide and submerged lands to United States: Gov C § 37358.

Compromise of litigation for federal condemnation of municipal tide or submerged lands: Gov C § 37360.

Collateral References:

Cal Jur 2d Mines and Minerals § 142, Municipal Corporations §§ 456 et seq., Public Lands §§ 61, 65.

Am Jur 2d Municipal Corporations, Counties, and Other Political Subdivisions §§ 538, 539, Public Lands §§ 108, 110, 112, 116.

Law Review Articles:

The Tideland Trust: Economic currents in a traditional legal doctrine (1974) 21 UCLA LR 826.

Attorney General's Opinions:

16 Ops Atty Gen 69 (what mineral rights are retained by the state in lands sold under the provisions of Stats 1921 ch 303).

Annotations:

Power of city or its officials as to compromise and settlement. 105 ALR 170, 15 ALR2d 1359.

§ 6403. Application of chapter

This chapter shall not be construed as applicable to the sale or exchange by the State of the following lands:

(a) Lands acquired by the State on sale thereof for delinquent taxes, other than lands the deed for which is required to be filed with the Department of Finance or the commission.

(b) Lands acquired by the State by foreclosure of any lien for taxes due the State, or for penalties or interest thereon, or by execution of any judgment for money due the State, or lands which are seized by the State and sold pursuant to Section 7891 of the Revenue and Taxation Code.

(c) Lands acquired by the State under the provisions of the Streets

STATE OF CALIFORNIA—THE RESOURCES AGENCY GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF FISH AND GAME
330 Golden Shore, Suite 50
Long Beach, CA 90802
(213) 590-5113

February 5, 1990

Paul Kielhold
Land Management Department
County of San Bernardino
385 N. Arrowhead Avenue
San Bernaradino, CA 92415-0182

Dear Mr. Kielhold:

We have reviewed the Notice of Preparation for the proposed Hidden Valley Hazardous Waste Repository project located in the Hidden Valley area of the Cady Mountains, approximately 17 miles northeast of Newberry Springs, in San Bernardino County.

The proposed project would consist of a receiving/transfer facility, a containment storage area, and road and rail access. The containment/storage area will be developed on a phased basis at a projected rate of 5-10 acres per year. The total project area is 11,500 acres.

The project is inadequately described and a full environmental evaluation is not possible at this time. To enable our staff to adequately review and comment on this project, the following information must be included in the Draft EIR:

1) A complete assessment of flora and fauna within the project area. Particular emphasis should be placed upon identifying endangered, threatened, and locally unique species. Species of special concern include the desert tortoise, a state threatened and Federally endangered species, and the bighorn sheep. 2) Documentation of direct, indirect, and cumulative impacts expected to adversely affect biological resources within and adjacent to the project site. 3) A discussion of mitigation measures proposed to offset such impacts. 4) Assessment of growth-inducement factors potentially affecting natural open space and biological resources. Landscape programs should include native trees and shrubs that provide habitat for wildlife.

The Hidden Valley site lies between two artificial watering devices installed by the Department and the Bureau of Land Management to benefit the bighorn sheep population residing in the Cady Mountains. Bighorn sheep tracks have been observed on the project access road area on numerous occasions, indicating that they move across here during their migrations. Completion of the project could result in substantial traffic, causing significant interference with the migrations and potentially resulting in direct traffic losses of bighorn.

We also request the following:

Describe construction methods, grading plans, storage cell location and development, sealants, and fencing; describe facilities to protect the natural environment against floods, and related natural disasters; assess the potential effects of hazardous waste particulates upon surrounding natural habitat and wildlife; describe traffic flow projections and potential effects of that traffic on wildlife; discuss protection measures to avoid against accidential spills on highways, waterways, and underground water supplies, and provide an accidental spill contingency plan.

The project as described does not detail the work proposed for streambed alteration activity. The project sponsor must identify specific streambed alterations and flood control structures proposed in order for the Department to properly comment on this document. The applicant should be aware that if mitigation measures are not provided in this document, the Department may require such mitigation measures through jurisdiction established under Fish and Game Code Sections 1601-1603.

Diversion, obstruction of the natural flow or changes in the bed, channel, or bank of any river, stream, or lake will require notification to the Department of Fish and Game as called for in the Fish and Game Code. This notification (with fee) and the subsequent agreement must be completed prior to initiating any such changes. Notification should be made after the project is approved by the lead agency.

Thank you for the opportunity to review and comment on this project. If you have any question, please contact Jack L. Spruill of our Environmental Services staff at (213) 590-5137.

Sincerely,

Rolf E. Mall for

Fred Worthley
Region Manager
Region 5

cc: Office of Planning & Research

United States Department of the Interior

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE ENHANCEMENT
SOUTHERN CALIFORNIA FIELD STATION
Laguna Niguel Office
Federal Building, 24000 Avila Road
Laguna Niguel, California 92656

In Reply Refer To:
FWE/SCFS-LNO (1-6-90-TA-81)

January 12, 1990

Paul Kielhold
Land Management Department
County of San Bernardino
385 N. Arrowhead Avenue
San Bernardino, California 92415-0182

Dear Mr. Kielhold:

The Fish and Wildlife Service (Service) has reviewed the notice of preparation of a draft environmental impact report for the Hidden Valley Resources Hazardous Waste Repository. The proposed project, which would be located in Hidden Valley of the Cady Mountains, east of Barstow in San Bernardino County, would consist of 11,500 acres of disposal areas, support structures, and a road and rail access system.

The Service believes the following issues should be thoroughly addressed in the draft report:

1. The draft report should fully describe the biological resources of the project area and provide lists of the plant and animal species which can occur on-site. Particular emphasis should be placed on sensitive species, such as Federal and State listed and candidate species. This analysis should include the desert tortoise (Xerobates agassizii) which is a federally listed endangered species. Because Section 9 of the Endangered Species Act prohibits the take of listed species, the field studies involved with the proposed project should be thorough enough to ensure that no individuals of the species are adversely affected. Should evidence of tortoises be found, the Service should be contacted by the lead Federal agency, if a Federal connection is involved in project development; otherwise, the applicant should contact us to determine the need for a Section 10(a) permit.

Additionally, the draft report should consider the impact of the proposed project on the flora and fauna of the lake bed itself and the species which depend on them. Desert playas often support an array of species which lie dormant in the sediments of

the lake surface until the lake is flooded. After rains, these species emerge, breed, and reburrow before the lake again dries. During times of inundation, desert lakes form important resting and feeding places for migratory shorebirds and waterfowl.

2. The report should also describe the potential impacts to resident and migratory species, such as desert bighorn sheep (Ovis canadensis nelsoni), and the measures which will be included as part of the project to mitigate these impacts. The impact analysis should also include the indirect effects of altering the sheet flow often found on alluvial fans.

3. Projected water use by the proposed project and its effects on the area's biological communities should be discussed. The report should also evaluate the cumulative impacts of water use in this arid region and the Mojave River valley to determine whether the proposed project could have an impact on the Mohave tui chub (Gila bicolor mohavensis), a federally listed endangered species which inhabits springs and ponds at Soda Dry Lake.

4. The report should examine the potential impacts of hazardous waste disposal on surrounding natural areas. Means of mitigating these impacts should be investigated and presented in the draft report.

5. Preparers of the report should be aware of the requirements of the Clean Water Act with regard to the placement of fill material in waters of the United States and wetland areas. The U.S. Army Corps of Engineers (Corps) administers the Section 404 program of the Clean Water Act and has considered dry lakes to be waters of the United States. As part of the Corps' permitting procedure for this project, should it go forward, the Fish and Wildlife Service and the Environmental Protection Agency would provide comments to the Corps regarding the adequacy of the impact analysis and the associated mitigation measures. For the purposes of this public review, the applicant should also provide a full alternatives analysis. For further information, please contact:

U.S. Army Corps of Engineers
P.O. Box 2711
Los Angeles, California 90053
Attn: Regulatory Branch
(213) 798-5606

6. The draft report should consider the indirect and cumulative impacts of the project on surrounding natural habitats. These impacts include, but are not limited to, increased human populations, increased pet and feral animal populations, noise, lighting, and trash.

7. The report should consider project alternatives, especially if the environmental impacts of the proposed project can not be avoided or mitigated to insignificance.

Recently, the Service provided comments to your office on a notice of preparation for a hazardous waste disposal site at Broadwell Dry Lake. The Service believes that siting of these facilities should be evaluated based on a county-wide need for hazardous waste disposal. These evaluations should include site selection processes that fully consider alternatives based on fish, wildlife, and other environmental concerns.

The Service appreciates the opportunity to participate in your planning process. If you have any questions, please contact Ray Bransfield of my staff at (714) 643-4270.

Sincerely,

Brooks Harper

Brooks Harper
Acting Field Supervisor

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
818 West Seventh Street, 12th Floor, Los Angeles, CA 90017

FAX TRANSMITTAL

COMMENTS

HIDDEN VALLEY, HAZARDOUS WASTE REPOSITORY, NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT

1. CEQA requires a full disclosure of all pertinent facts, the proper identification of all adverse impacts, and their mitigation. It is also necessary to propose alternatives to the proposal and their impact identification and mitigation. Please take into account all possible impacts relating to the concerns raised by the public at the post application meeting that was held at Newberry Springs.

2. Cortese (AB 3081) requires that impacts be monitored and recorded, so as to effectively mitigate any adverse impacts. Please ensure that impact mitigation and recordation be made part of the EIR. Ensure that there is funding to do this. Responsibility should be placed on the proponent for impact monitoring and mitigation.

3. It is recommended that a needs assessment and a complete risk assessmentor assessments should be done prior to the issuance of any permit/s. All risks associated with environmental issues should be covered under the risk assessment. The assessment has to be performed by a qualified assessor, or assessors. The EIR should specify how the risk assessment/s will be performed.

4. It is recommended that the role of the Local Assessment Committee (LAC) should be documented in the EIR. This should include the manner the LAC performs, or proposes to perform the work assigned to it under Tanner (AB 2948). This will facilitate the proper disclosure of all possible impacts, as mandated by CEQA. LACs have the right to independently assess all relevant issues before finalizing its work.

5. The need to assess the application of Regional Plan goals as required by Tanner (AB 2948) should be addressed in the EIR. This may be linked to the needs assessment mentioned in # 3, if deemed appropriate.

6. It is recommended that transportation related issues be made part of risk assessment mentioned in # 3.

7. The EIR should address any impacts associated with the adopted regional plans, namely, Air Quality Management Plan of 1989, Growth Management Plan of 1989, and the Regional Mobility Plan of 1989. Issues that are germane to the three regional needs to be addressed in the EIR.

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY
GEORGE DEUKMEJIAN, Govern

DEPARTMENT OF TRANSPORTATION
DISTRICT 8, P.O. BOX 231
SAN BERNARDINO, CALIFORNIA 92402
TDD (714) 383-4609

90 JAN 11 AM 10:38

08-SBd-40-R32.4

January 8, 1990

Mr. Paul Kielhold
San Bernardino County
385 North Arrowhead Avenue
San Bernardino, CA 92415-0182

Dear Mr. Keihold:

We have reviewed a Notice of Preparation of a Draft Environmental Impact Report for Hidden Valley Resources in the Hector area of San Bernardino County and request consideration of the following:

Due to the dangerous nature of hazardous waste, we request that all related trips should be made outside of the peak period. In addition, procedures concerning accidental spillage should be addressed.

If you have any questions, please contact Richard Malacoff at ATSS 670-4550 or (714) 383-4550.

Very truly yours,

Harvey J. Sawyer

HARVEY J. SAWYER
Chief, Transportation Planning
Branch B

LAND MANAGEMENT DEPARTMENT

385 North Arrowhead Avenue • San Bernardino, CA 92415-0180 • (714) 387-4091

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

JOHN N. JAQUESS
Land Management Director

OFFICE OF PLANNING
Sharon W. Hightower
County Planning Officer

OFFICE OF SURVEYOR
Claude D. Tomlinson, L.S.
County Surveyor

OFFICE OF BUILDING AND SAFETY
Larry L. Schoelkopf, P.E.
County Building Official

90 JAN 19 AM 8:39

COMMENTS AND CONCERNS REGARDING

HIDDEN VALLEY RESOURCES, INC. PROPOSED

HAZARDOUS WASTE RESIDUAL REPOSITORY

DATE: 1-11-90

NAME: Norman & Sue Hickman

ADDRESS: (Res.) 38976 Tami Rd, Newberry Springs, CA 92365
(Mailing) P.O. Box 36, Yermo, CA 92398

AFFILIATION: None

****

Please use this form to submit written comments on the proposed project. Indicate what information you believe should be included or analyzed in the Environmental Impact Report.

Please mail to Paul Kielhold, Environmental Analyst, Office of Planning; 385 N. Arrowhead Avenue; San Bernardino CA 92415-0182.

****

COMMENTS:

See Attached -

HVR.COM

COMMENTS AND CONCERNS REGARDING
HIDDEN VALLEY RESOURCES, INC. PROPOSED
HAZARDOUS WASTE RESIDUAL REPOSITORY

DATE: 1-11-90

NAME: Norman and Sue Hickman

ADDRESS: (Res.) 38976 Tami Rd., Newberry Springs, CA. 92365
(Mailing) P.O. Box 36, Yermo, CA. 92398

AFFILIATION: None

COMMENTS:

We are concerned with the following items and feel they should be addressed in the Environmental Impact Report on this project.

TECHNICAL REPORTS

Do reports generated by employees or principals of Hidden Valley Resources present a conflict of interest in the information provided for Public Review on this project?

Review of the Initial Study Environmental Checklist Form for this project indicates that approximately half of the Technical Reports, used as references, were written by employees or principals of Hidden Valley Resources. We would like to review Technical Information from <u>independent sources</u> on Geologic Mapping, Seismic Data, Climatic Conditions, Surface Water Hydrology, Benefits of Underground Containment Structures, Design Concepts for Containment Structures, Gravity Surveys, Mining Feasibility, and Groundwater Hydrology.

CONTAINMENT STRUCTURES

We are concerned that the underground containment structures proposed are not adequate to contain the amount of hazardous material proposed to be stored.

MONITORING OF CONTAINMENT STRUCTURES

We are extremely concerned about the lack of monitoring facilities for breaks or leaks in the underground containment structures.

The Environmental Impact Report should specifically address the monitoring of the containment structures. The monitoring facilities should not be limited to an electronic basis only, but a visual basis should be required. Additional attention should be addressed to how the underground containment structures would be repaired should a break or leak occur.

COMMENTS AND CONCERNS REGARDING
HIDDEN VALLEY ROSOURCES, INC.
HAZARDOUS WASTE RESIDUAL REPOSITORY

DATE: 1-11-90

NAME: Norman and Sue Hickman

FUTURE IMPLICATIONS

If the hazardous material remains in the underground storage facilities at this site for more and 50 years, what is the environmental impact at that time. If this hazardous material is never reclaimable, what will be done with the material? With the site? Is the Bond for this site adequate for the protection of future generations?

FUTURE PUBLIC HEARINGS

Newberry Springs, remotely located from the Governing Agencies of the County of San Bernardino, should have the benefit of having any and all Public Hearings (including the Board of Supervisors) on Hazardous Waste Repositorys **held in this community.** Holding any and all Public Hearings in this community (including the Board of Surpervisors) would give the local residents, who are **most** affected by this issue, a greater opportunity to participate in the Land Use decisions that affect their community.

Jan 2. 1990

I object to the proposed toxic waste sight in our community for the following reasons:

Possible contamination of our water supply.

Health risks to our familys & friends.

Possible contamination of home grown food that we will be consuming.

And risks to our animals.

Rose Bowen
45438 Martin Rd
Newberry Spgs., Ca.
92365

Jan. 2nd, 1990

Contamination.

(1) ~~Termination~~ of our water basin.
(2) - Amount of water used to wash down trucks + Rail Cars.
(3) - Where will the contaminated waste water used to wash the truck & Rail cars go?
(4) - Danger from all the Earthquake faults.
(5) - Endanger all wild life.
(6) - Endangering public lines.
(7) - Denial to public access.
(8) - Endangering our Children.
(9) - Endangering all plants + Vegetation.
(10) - Lowering the Value of our property.

L. F. Webster

Jan. 2nd, 1990

(Contamination)

(1) ~~Termination~~ of our water basin.
(2) Endangering all plants + Vegetation.
(3) - Endangering our Children.
(4) - Denial to public access.
(5) - Endangering public lines.
(6) - Endangering all wild life.
(7) - Danger from all the Earth-quake faults.
(8) - Amount of water used to wash down trucks + rail Cars.
(9) - Where will all the waste water go, from the wash down trucks + rail Cars?
(10) - Lowering the Value of our property.

Alphons Van Beiten
45 Hyde Clinton Rd.
New Lebanon, Columbia Phone 392 5211

Jan 2nd, 1990

(1) Contamination of our water bason.
(2) - Amount of water used to wash down the trucks + rail cars.
(3) - Where will the contaminated waste water go, used to wash down the trucks + rail cars.
(4) - Endanger wild life.
(5) - Danger from all the Earth-quake faults
(6) - Denial of public access.
(7) - Endangering public lines.
(8) - Endangering our Children.
(9) - Endangering our plants + all Vegetation.
(10) - Lowering the Value of our property.

Mr + Mrs Jim Porter
45545 Martin Rd.
Newberry Spgs. Calif.
92365
ph. # (619) 257-3865

89 DEC 12 AM 7:47

Samuel Yu
1251 W. Sepulveda Blvd. #189
Torrance, California 90502

December 6, 1989

Paul Tielhold
San Bernardino County Office of Planning
385 North Arrowhead Avenue
San Bernadino Califonria 92415-0182

Today I received your letter dated December 6th with concern to the proposed hazardous waste facility. With such a very short notice of the proposed hearing, scheduled for December 13th, is it possible that all concerned parties have time to reply? I certainly hope so, I for one wish it known that I am in opposition to such a facility and request that my opposition is recorded.

As a citizen, tax payer and land owner I am extremely concerned that what little land is left for purposes of food production and environmental preservation of natural means will be taken over by big businesses that contaminate our soils. I do realize the need for waste management and support all efforts towards a solution, but taking what little precious land we have left and destroying it is not the answer.

Other factors to consider are the effects on the community itself. What about the farmers and the food they produce for populations. The young children who live and play near such sites and the adult and senior adult community who wish to raise families and live quietly without concern of carcenogenic chemicals in their air and land. These are the people who would be affected and these are the things that should be considered.

For further consideration is previous communication on this same subject. Please take time to read and understand my sincere objection to this potentially dangerous hazardous waste site.

Sincerely,

Samuel Yu

Samuel Yu
542-041-17

Hidden Valley Resources

Samuel Yu
1251 W. Sepulveda Blvd. #189
Torrance, California 90502

November 3, 1989

Environmental Public Works Agency
Land Management Department
Office of Planning North Desert Team
15505 Civic Drive
Victorville, California 92392-0180

Gentlemen:

In reply to property owners project notice dated October 31, 1989 for the proposal to change the general plan allowing a hazardous waste permit or a conditional use permit to establish a hazardous waste management facility I strongly oppose.

This beautiful land and country side should not be ruined and contaminated with waste, chemicals and other toxins that could effect this land for generations to come. I strongly urge to consider a no vote in this matter.

This land could be used as farm land, it can produce food for the communities. We need to recognize the need for preserving land and find alternatives to hazardous waste handling and reserve this precious area for living purposes.

I hope that you will consider my comments and give serious thought to the long term problems communities face brought on by these types of facilities.

Sincerely,

Copy

Samuel Yu
542-041-17

SY:dm

Objection to Hazardous Waste Site.

1. Water contamination

2. Air Pollution

3. Excessive use of water which will lower water table.

4. Cancer causing air + water pollutents.

5. Danger of accident while transporting on Hwy 40.

6. High winds which will spread the Cancer causing materials.

7. Danger to desert wild life.

I think there's something real wrong when they will allow Hazardous waste into the desert, when they cancell a motor cycle race because of harm to turtles.

Colleen G. Hyppett

1/2/90

1. Water Pollution

2. Air Pollution

3. Excessive water use which will lower our water table.

4 Cancer causing pollutants to the air and water

5. Danger in transporting.

6. High wind area which will spread the pollutants

7. Danger to wild life.

Bernice Wilson

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
BARSTOW RESOURCE AREA
150 COOLWATER LANE
BARSTOW, CALIFORNIA 92311-3221
(619) 256-3591

IN REPLY REFER TO:
CACA-24320
2800/8500 WSA# 251
(CA-068.21)

Paul Kielhold
Land Management Department
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, CA 92415-0180

OCT 18 1990

Dear Mr. Kielhold:

Enclosed for your information and files regarding the Hidden Valley Resources project are copies of:

1) Federal Register Notice of Intent,
2) Notice of Proposed Action/Lands Under Wilderness Review including mail list, and
3) Response from US Fish and Wildlife Service to BLM memo of September 28, 1990 requesting a species list.

Any questions may be directed to Sharon Paris, Environmental Coordinator of this office.

Sincerely,

Karla K. H. Swanson
Acting Area Manager

ACTING

Enclosures

cc:
Martha Sanera
County of San Bernardino
Land Management Department
15505 Civic Drive
Victorville, CA 92392

Linda Brody
Chambers Group
1761-A East Garry Avenue
Santa Ana, CA 92705

Brian Patrick
Hidden Valley Resources, Inc.
1999 Edison Highway, Suite 32
Bakersfield, CA 93305

Pam Barber
Chairperson
Local Assessment Committee
Cottonwood
Newberry Springs, CA 92365

TAKE PRIDE IN AMERICA

Base Closure
Comment: 1013 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

S-35-Q
Monroeville Area Site 25
C.E. Kelly Support Fac.; Lindsey Lane R.D. #2
Monroeville, PA. *Co:* Allegheny
Landholding agency: COE
Property number: 319030057
Status: Unutilized
Base Closure
Comment: 1117 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

S-36-Q
Monroeville Area Site 25
C.E. Kelly Support Fac.; Lindsey Lane R.D. #2
Monroeville, PA. *Co:* Allegheny
Landholding agency: COE
Property number: 319030058
Status: Unutilized
Base Closure
Comment: 1117 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

S-37-Q
Monroeville Area Site 25
C.E. Kelly Support Fac.; Lindsey Lane R.D. #2
Monroeville, PA. *Co:* Allegheny
Landholding agency: COE
Property number: 319030059
Status: Unutilized
Base Closure
Comment: 1117 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

S-38-Q
Monroeville Area Site 25
C.E. Kelly Support Fac.; Lindsey Lane R.D. #2
Monroeville, PA. *Co:* Allegheny
Landholding agency: COE
Property number: 319030060
Status: Unutilized
Base Closure
Comment: 1117 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

S-39-Q
Monroeville Area Site 25
C.E. Kelly Support Fac.; Lindsey Lane R.D. #2
Monroeville, PA. *Co:* Allegheny
Landholding agency: COE
Property number: 319030061
Status: Unutilized
Base Closure
Comment: 117 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

S-40-Q
Monroeville Area Site 25
C.E. Kelly Support Fac.; Lindsey Lane R.D. #2
Monroeville, PA. *Co:* Allegheny
Landholding Agency: COE
Property number: 319030062
Status: Unutilized
Base Closure
Comment: 1117 sq. ft.; 1 story frame residence with playground area; possible asbestos; scheduled to be vacated 8/91.

Texas

Marine Safety Detachment
Brownsville Ship Channel
Brownsville, TX. *Co:* Cameron
Landholding agency: GSA
Property number: 549030016
Status: Excess
Comment: 2008 sq. ft. and 900 sq. ft.; 2—1 story cinder block buildings; off-site use only. Property previously reported under HUD #879010006.
GSA NO. 7-U-TX-1006

Virginia

Family Housing Quarters No. 1
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030042
Status: Unutilized
Base Closure
Comment: 1053 sq. ft.; 1 story 3-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 2
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030043
Status: Unutilized
Base Closure
Comment: 1053 sq. ft.; 1 story 3-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 3
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030044
Status: Unutilized
Base Closure
Comment: 1053 sq. ft.; 1 story 3-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 4
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030045
Status: Unutilized
Base Closure
Comment: 1053 sq. ft.; 1 story 3-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 5
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030046
Status: Unutilized
Base Closure
Comment: 1053 sq. ft.; 1 story 3-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 6
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030047
Status: Unutilized
Base Closure
Comment: 844 sq. ft.; 1 story 2-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 7
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030048
Status: Unutilized
Base Closure
Comment: 844 sq. ft.; 1 story 2-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 8
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030049
Status: Unutilized
Base Closure
Comment: 844 sq. ft.; 1 story 2-bedroom residence; scheduled to be vacated 8/91.

Family Housing Quarters No. 9
Manassas Family Housing
7801 Aden Road
Manassas, VA. *Co:* Prince William
Location: Located 1 block east of SR 234 at the intersection of SR 619 and SR 648.
Landholding agency: COE
Property number: 319030050
Status: Unutilized
Base Closure
Comment: 844 sq. ft.; 1 story 2-bedroom residence; scheduled to be vacated 8/91.

Universe of Properties:

Total	67
Suitable	65
Suitable Buildings	63
Suitable Land	2
Unsuitable	2
Unsuitable Buildings	1
Unsuitable Land	1
Number of Resubmissions	1

[FR Doc. 90-22828 Filed 9-27-90; 8:45 a.m.]
BILLING CODE 4210-29-M

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[CA-060-00-5101-09-XBHA; CACA 24320]

Intent To Prepare an EIS Proposed Specified Hazardous Waste Facility

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of intent.

SUMMARY: The Bureau of Land Management (BLM) in coordination with the County of San Bernardino will prepare an Environmental Impact Report/Environmental Impact Statement

(EIR/EIS) for the proposed Specified Hazardous Waste Facility in the Cady Mountains approximately 40 miles east of Barstow, California.

The applicant, Hidden Valley Resources, Inc. (HVR), has applied to the County for a Conditional Use Permit and a General Plan Amendment to develop a specified hazardous waste facility on land owned by HVR for the permanent storage of treated hazardous wastes. HVR has applied to BLM for a right-of-way for access road and a railroad spur from Hector and Interstate 40 into Hidden Valley of the Cady Mountains and for access across public lands to lands owned by HVR within the project boundary. The off-site access is for a proposed 60 foot wide right-of-way for road only and 300 foot wide right-of-way for road and rail spur combined. The off-site right-of-way would be approximately 10 miles in length across public lands, of which about 8 miles are across lands within the Cady Mountains Wilderness Study Area.

SUPPLEMENTARY INFORMATION: Development of the hazardous waste facility is proposed in two phases on private lands involving a total of approximately 1,300 acres with an estimated storage capacity of 120 years. A range of alternatives to be analyzed include, alternative access routes, facility designs, disposal methods, and site locations, as well as the no action alternative.

Initially, HVR proposed to acquire public land from BLM for an enlarged facility site totaling 11,500 acres. The acquisition of public lands was determined to be in nonconformance with BLM land use plans and is rejected from further analysis.

Public Participation

Pre- and post-application public meetings were held by the County in Newberry Springs, California. Comments presented during these meetings will serve to define the scope of the EIR/EIS. Issues identified at the scoping meetings included the need for interagency/regional planning, the relationship to adjacent land uses, impacts to wilderness qualities, water, air, and threatened and endangered species, risk assessment, health and safety, geology and faults in the area, means of transportation, flooding problems, and construction of storage containers.

A Local Assessment Committee (LAC) was established which meets on the first and third Tuesdays of each month in Newberry Springs, 20 miles east of Barstow, to discuss with the proponent details of the project. The LAC reports to the County Board of Supervisors and represents generally, the interests of the residents of the County and adjacent communities. The LAC meetings are open to the public and provide for continual public involvement in the scoping and analysis process of this proposal.

Public meetings on this proposal will be held upon release of the draft EIR/EIS and will be announced in a Notice of Availability in the Federal Register.

Formal comments on this Notice will be accepted by BLM for 30 days after date of publication. Comments are specifically requested on issues, concerns, and alternatives, which will be considered in the EIR/EIS.

ADDRESSES: Send comments to BLM, Barstow Resource Area, 150 Coolwater Lane, Barstow, CA 92311, Attn: Sharon Paris. Further information on this proposal, on the LAC meetings, or to be placed on the mailing list for the EIR/EIS may also be requested through this address or by telephone at (619) 256-3591.

Dated: September 20, 1990.

Donald Sassaville,

Acting Area Manager.

[FR Doc. 90-22822 Filed 9-27-90; 8:45 am]

BILLING CODE 4310-40-M

[CO-030-90-4328-10-1784]

Montrose District Grazing Advisory Board Meeting

September 19, 1990.

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of meeting.

SUMMARY: Notice is hereby given in accordance with 43 CFR subpart 1784, that a meeting of the Montrose District Grazing Advisory Board will be held on October 17, 1990, in Montrose, Colorado.

DATES: A meeting is scheduled October 17, 1990.

FOR FURTHER INFORMATION CONTACT: Bill Hensley, Bureau of Land Management, 2465 South Townsend, Montrose, Colorado 81401, telephone (303) 249-7791.

SUPPLEMENTARY INFORMATION: The Board will convene at 9:30 a.m. on October 17, 1990, in the conference room of the Montrose District BLM Office in Montrose, Colorado. Agenda items will include: minutes of the previous meeting, public presentations and requests, range improvement project review, new Board project proposals, updates on current issues, and arrangements for the next meeting. The meeting will adjourn at 5 p.m.

The meeting is open to the public. Anyone wishing to make an oral statement must notify the District Manager at the above address prior to the meeting date. Depending on the number of persons wishing to make oral statements, a per person time limit may be established by the District Manager.

Minutes of the board meeting will be maintained in the District Office and be available for public inspection and reproduction (during regular business hours) within thirty (30) days following the meeting.

Dated: September 18, 1990.

Kenneth B. Rasmussen,

Acting District Manager.

[FR Doc. 90-22823 Filed 9-27-90; 8:45 am]

BILLING CODE 4310-40-M

[NV-030-00-4212-11; N-52971]

Realty Action; Lease/Purchase for Recreation and Public Purposes Clark County, NV

The following described public land in Las Vegas, Clark County, Nevada has been identified and examined and will be classified as suitable for lease/purchase under the Recreation and Public Purposes Act, as amended (43 U.S.C. 869 *et seq.*). The lands will not be offered for lease/purchase until at least 60 days after the date of publication of this notice in the Federal Register.

Mount Diablo Meridian, Nevada

T. 21 S., R. 62 E.,
Sec. 19, N½NW¼NE¼SW¼.
Aggregating 5 acres (gross).

This parcel of land contains approximately 5 acres. Clark County intends to use the land for Las Vegas Metropolitan Police Department Substation. The lease and/or patent, when issued will be subject to the provisions of the Recreation and Public Purposes Act and applicable regulations of the Secretary of the Interior, and will contain the following reservations to the United States:

1. A right-of-way thereon for ditches and canals constructed by the authority of the United States, Act of August 30, 1890, 26 Stat. 391, 43 U.S.C. 945.

2. All minerals shall be reserved to the United States, together with the right to prospect for, mine and remove such deposits from the same under applicable law and such regulations as the Secretary of the Interior may prescribe.

and will be subject to:

1. An easement for streets, roads and public utilities in accordance with the transportation plan for Clark County.

2800
8500 WSA #251/D
(CA-068.21)

NOTICE OF PROPOSED ACTION
LANDS UNDER WILDERNESS REVIEW

SEP 2 1 1990

STATE-	California
DISTRICT-	California Desert
COUNTY-	San Bernardino
RESOURCE AREA- Attn:	Barstow Area Manager Bureau of Land Management 150 Coolwater Lane Barstow, CA 92311
WSA - NAME: NUMBER:	Cady Mountains CDCA #251

1. Description of Action

The Bureau of Land Management (BLM) in coordination with the County of San Bernardino will prepare an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Specified Hazardous Waste Facility in the Cady Mountains approximately 40 miles east of Barstow, California. The involved public lands are described as T. 8 N., R. 5 E., sections 2, 3, 4, 10, 11 and 15; T. 9 N., R. 5 E., sections 2, 3, 4, 6, 7, 8, 10, 15, 18, 19, 20, 22, 26, 27, 28, 30, 31, 34, and 35; T. 9 N., R. 6 E., section 6; and T. 10 N., R. 6 E., sections 30, 31, and 32.

2. Description of Activity

The applicant, Hidden Valley Resources, Inc. (HVR), has applied to the County for a Conditional Use Permit and a General Plan Amendment to develop a specified waste facility on land owned by HVR for the permanent storage of treated hazardous wastes. HVR has applied to BLM for a right-of-way for an access road and a railroad spur from Hector and Interstate 40 to the site. Some of the involved public lands are part of the Cady Mountains Wilderness Study Area.

Development of the hazardous waste facility is proposed in two phases involving private lands that total approximately 1,300 acres with an estimated storage capacity of 120 years. The facility is designed to receive, identify, categorize, and store dry, treated, stabilized hazardous waste. The containment and storage areas would consist of several underground steel or concrete storage containers. Once filled to capacity, the containers would be sealed and capped and the surface area recontoured and revegetated. It is estimated that the facility would receive and transfer approximately 30 to 50 rail car and 10 to 15 truck loads of material per day.

The right-of-way for access and utilities is proposed from Interstate 40 at the Hector exit to the site in Hidden Valley approximately 10 miles to the north. A two-lane paved road and a railroad spur line from Hector would provide access. Gravel roads are proposed to provide access between the noncontiguous disposal sites.

Pre- and post-application public meetings were held by the County in Newberry Springs, California. Comments presented during these meetings will serve to define the scope of the EIR/EIS. Issues

identified at the scoping meetings included the need for interagency/regional planning, the relationship to adjacent land uses, impacts to wilderness qualities, water, air, and threatened and endangered species, risk assessment, health and safety, geology and faults in the area, means of transportation, flooding problems, and construction of storage containers. A range of alternatives to be analyzed in the EIR/EIS include, alternative access routes, facility designs, disposal methods, and site locations, as well as the no action alternative.

A Local Assessment Committee (LAC) was established which meets on the first and third Tuesdays of each month in Newberry Springs, 20 miles east of Barstow, to discuss with the proponent details of the project. The LAC reports to the County Board of Supervisors and represents generally, the interests of the residents of the County and adjacent communities. The LAC meetings are open to the public and provide for continual public involvement in the scoping and analysis process of this proposal.

Public meetings on this proposal will be held upon release of the draft EIR/EIS and will be announced in a Notice of Availability in the Federal Register.

3. Supplemental Information

During the formulation period of this proposal, HVR proposed to acquire public land in Hidden Valley. The BLM informed HVR that the Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP) does not allow exchange of WSA lands except under extraordinary circumstances and that no such circumstances appear to exist.

The involved lands were designated in the California Desert Conservation Area (CDCA) Plan (1980, as amended) as Multiple Use Class L (limited). If the area is not designated wilderness the lands would remain Class L. Class L lands protect sensitive, natural, scenic, ecological, and cultural resources values. Public lands designated as Class L are managed to provide for generally lower-intensity, carefully controlled multiple use of resources, while ensuring that sensitive values are not significantly diminished. Class L lands are not available for sale or exchange unless there is an overriding public interest which outweighs other management goals to warrant further consideration through a plan amendment. There is no information to date which indicates that such an exchange is necessary or in the public interest.

The issue of acquisition of public lands is not in conformance with land use plans. The subject of potential exchange of public lands will be included in the Alternatives Considered But Rejected section of the EIR/EIS.

4. Chronology of Events

Date	Event
1988/89	HVR contacts BLM regarding their pending proposal
12/13/89	Post-application (County) public meeting
2/8/90	Impacts from HVR survey crew discovered
4/2/90	Reclamation completed (see previous NOPA for details)
5/24/90	Initial project meeting (BLM, County, HVR, and contractor)

7/9/90	Memorandum of Understanding signed by BLM, County, and HVR outlining how environmental document will be prepared
7/9/90	Right-of-way application received by BLM

5. For Further Information

For further information on this proposal, on the LAC meetings, or to be placed on the mailing list for the EIR/EIS contact Sharon Paris, Environmental Coordinator at the address shown above or by telephone at (619) 256-3591.

Don Sammell
Acting Area Manager
Barstow Resource Area

9/25/90
Date

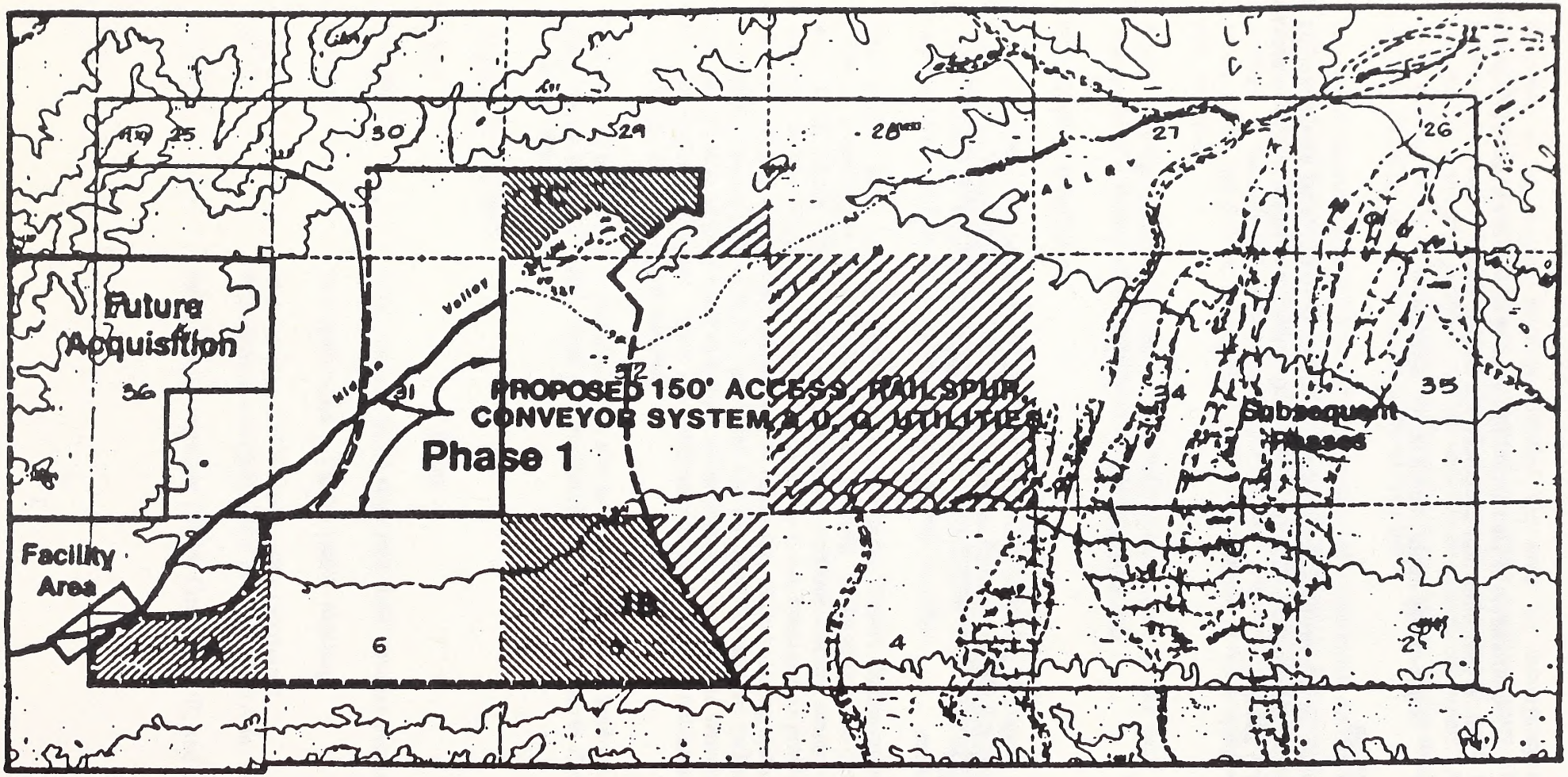


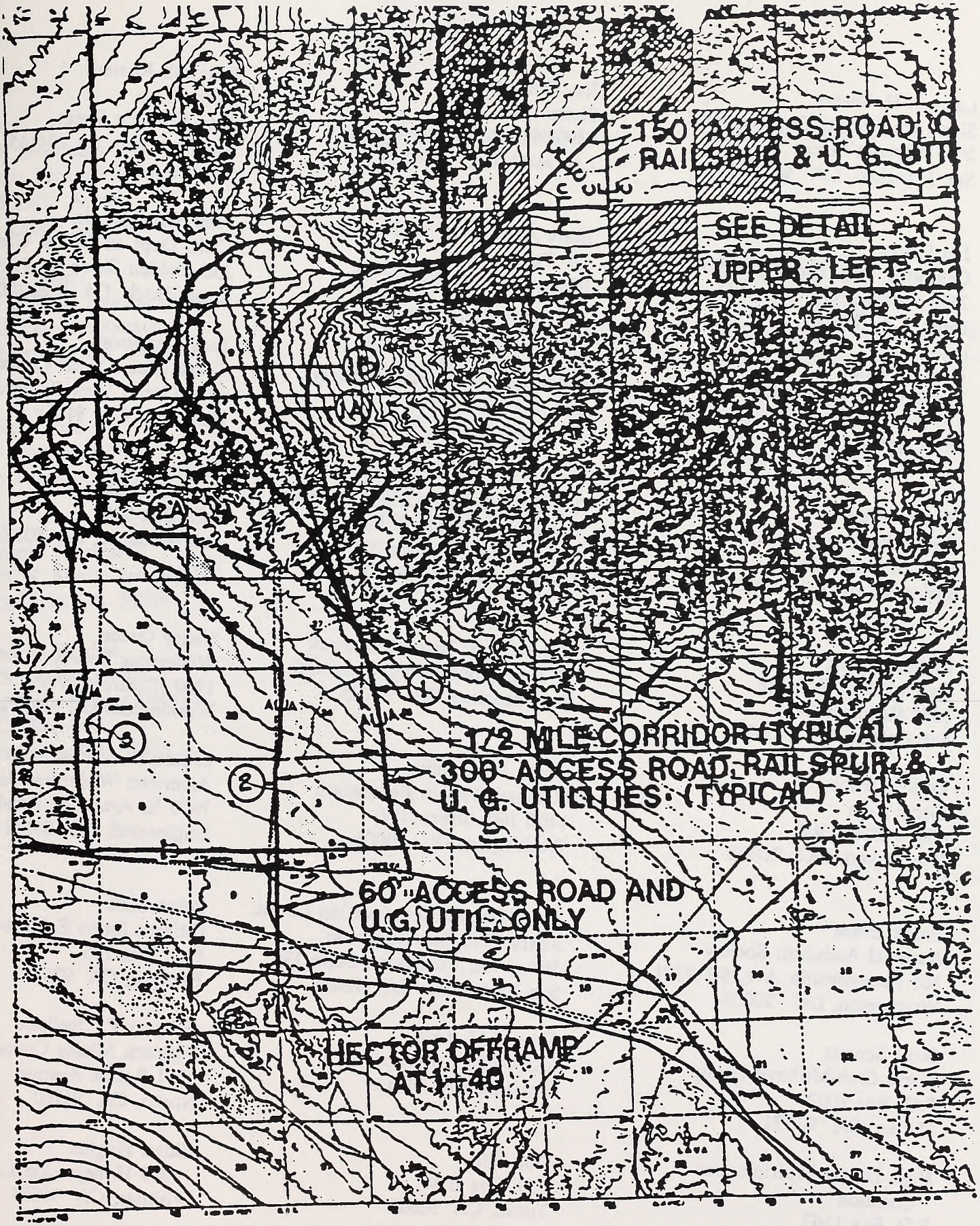
Figure 2-2 (Revised)
Hidden Valley Project Site Local Vicinity Map

Legend
- Project Boundary
- 2000' Setback
- Phase I Boundary

CONTAINMENT AREA (PHASE 1)
CONTAINMENT AREA (FUTURE)

N

Approximate Scale 1" = 3800'


150' ACCESS ROAD, O
RAIL SPUR & U. G. UTI
SEE DETAIL
UPPER LEFT
1/2 MILE CORRIDOR (TYPICAL)
300' ACCESS ROAD, RAIL SPUR &
U. G. UTILITIES (TYPICAL)
60' ACCESS ROAD AND
U.G. UTIL. ONLY
HECTOR OFFRAMP
AT I-40
LEGEND
RIGHT-OF-WAY CORRIDOR (PROPOSED)
RAILWAY
ALTERNATIVE ROUTES FOR RAIL & SURFACE ROUTES
PRIVATE OWNI
HVR OWNERS
STATE OWNEI
PROJECT SET
PROJECT BOU
W S A 251 BOU

Laurens H. Silvers
Sierra Club Legal Defense Fund
2044 Fillmore Street
San Francisco, CA 94115

Jim Eaton
California Wilderness Coalition
2655 Portage Bay, Ste. 3
Davis, CA 95616

Norbert Reidy
The Wilderness Society
116 New Montgomery, Ste 526
San Francisco, CA 94105

Harriet Allen
Desert Protective Council
3750 El Canto Drive
Spring Valley, CA 92077

Richard Spotts
Defenders of Wildlife
5604 Rosedale Way
Sacramento, CA 95822

Debbie Sease
Sierra Club
408 C Street NE
Washington, DC 20002

Brock Evans
National Audubon Society
801 Pennsylvania Ave, SE #301
Washington, DC 20003

Scott Simons
Sierra Club-Mohave Group
P.O. Box 1062
Phelan, CA 92371

High Desert Multiple Use
Coalition
P.O. Box 1167
Ridgecrest, CA 93555

Jim Dodson
Sierra Club
43904 North Galion Ave.
Lancaster, CA 93536

Mary Ann & Ronald Henry
329 Perdew Ave.
Ridgecrest, CA 93555

Dr. June Latting
California Native Plant Society
320 Maraville Drive
Riverside, CA 92507

W. Douglas Kari, Desert Survivors
Orrick, Herrington & Sutcliff
333 S Hope St., Suite 3100
Los Angeles, CA 90071

Natural Res. Defense Council
90 New Montgomery, Suite 620
San Francisco, CA 94105

David Alberswerth
National Wildlife Federation
1400 16th Street NW
Washington, DC 20005

Anne Dennis, Conservation Coord.
Sierra Club, San Gorgonio
568 N Mt. View Ave., Suite 130
San Bernardino, CA 92401

Donald M. Falk
323 Oakland Avenue
Oakland, CA 94611

Don Fife
P.O. Box 1054
Tustin, CA 92681

Deborah Reames
Sierra Club
2044 Fillmore Street
San Francisco, CA 94115

Fred Worthley, Jr.
Calif. Dept. of Fish & Game
330 Golden Shore St. #50
Long Beach, CA 90802-4247

Judy Anderson
Sierra Club, Desert Committee
4134 Ocean View Boulevard
Montrose, CA 91020

Mary Dedecker
P.O. Box 506
Independence, CA 93526

Nancy Green
Wilderness Society
1400 "I" Street, NW
Washington, DC 20005

Clifton R. Merritt
American Wilderness Alliance
7600 E. Arapahoe Road 114
Englewood, CO 80112

Peter Burk
Citizens for an E. Mojave Nat. Park
P.O. Box 106
Barstow, CA 92311

Gregory P. Ouellette
Western Mining Council Inc.
2051 Pacific Avenue
Norco, CA 91760

Elden Hughes
14045 Honeysuckle Lane
Whittier, CA 90604

Mary Swedelius
Desert Protection Council
4261 Fifth Avenue
San Diego, CA 92103

Harry Love
Sierra Club, Kaweah Chap.
5805 Daggett Avenue
Bakersfield, CA 93309

Steve Tabor
633 Post St. #672
San Francisco, CA 94109-8215

Vincent Markofski
2670 S. Myrtle Ave. #105
Monrovia, CA 91016

George Kenline
U.S. Forest Service
Big Bear Ranger District
P.O. Box 290
Fawnskin, CA 92333

State Director (CA-910)
BLM

Joan Reiss
Regional Director
The Wilderness Society
116 New Montgomery, Ste. 526
San Francisco, CA 94105

Russell Butcher
SW & CA Representative
Natl Parks & Cons Assn.
Box 67
Cottonwood, AZ 86326

State Director (CA-931)
BLM

William Tilden
Gresham, Varner, Savage
Tilden, and Nolan
600 North Arrowhead Ave. Ste. 300
San Bernardino, CA 92401-1148

Michael & Nancy Prather
Drawer D
Lone Pine, CA 93545

THE WILDERNESS SOCIETY

CALIFORNIA/NEVADA REGIONAL OFFICE

October 29, 1990

Donald Sasseville
Acting Area Manager
Barstow Resource Area
Bureau of Land Management
150 Coolwater Lane
Barstow, CA 92311

RE: Environmental Impact Report/Environmental Impact Statement for the proposed Hazardous Waste Facility in the Cady Mountains; CDCA-251.

Dear Mr. Sasseville:

Thank you for the opportunity to submit scoping comments on the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the proposed Specific Hazardous Waste Facility in by Hidden Valley Resources (HVR) in the Cady Mountains. The Wilderness Society has a long-standing interest in all actions affecting the public resources within the Barstow Resource Area. Our comments and concerns are noted below.

The EIR/EIs needs to consider a full range of alternatives and resulting impacts from each. Each alternative should describe immediate, direct, indirect and long-term impacts to natural resources on private and wilderness study lands in the Cady Mountains area. In addition, cumulative affects to the affected lands and the involved resources need addressing as well as overall impacts of the project to land uses surrounding the project area.

Our primary concern regards the proposal to build hazardous waste disposal site access roads through the Cady Mountain WSA. Paved roads are incompatible with wilderness lands and are in conflict with the Interim Management Plan Guidelines for lands under wilderness review. The EIR needs to address all conflicts in policy, including the IMP Guidelines and the California Desert Conservation Plan of 1980, that will be created by the construction of such roads. The building of roads and a railroad spur through the Cady Mountains WSA would significantly reduce the natural wilderness resources in this area. Further, the EIR must embody a complete analysis of the "no-action" alternative.

116 NEW MONTGOMERY, SUITE 526, SAN FRANCISCO, CA 94105
(415) 541-9144

The Cady Mountains and encompassing lands are host to a multitude of wildlife species including the federally listed threatened desert tortoise (Gopherus agassizi), the desert bighorn sheep, badgers and the Mojave fringe-toed lizard. The EIR/EIS should include a comprehensive analysis of all flora and fauna involved. The protected desert bighorn sheep, desert tortoise and other species habitats will be greatly reduced from the proposed project and special attention needs to be given to potential impacts. The EIR/EIS should embody mitigation methods to lessen the impacts to involved wildlife in the project area and in particular the wilderness study lands. Additionally, the environmental impact document needs to consider all possibilities of habitat loss, fragmentation, animal displacement and affects of increased human presence.

Road building and the vast amount of ground work to be done to construct the specific hazardous waste facility will undoubtedly create serious air quality problems in the project vicinity. The EIR/EIS should encompass pre-, mid-, and post-operations monitoring schedules and locations and details of equipments to be used. Repeated but not continual degradation of air quality from construction and use of the facility constitutes a threat to local air quality standards and possible violations and emissions standards need to be explained. Further, the potential for the release of toxic or hazardous emissions, from the hazardous waste facility during its construction and use, exists and needs consideration.

The water resources affected need complete analysis in the EIR/EIS. All lakes, streams, springs, seeps, and aquifers need to be described and the potential impact to these resources inspected. Groundwater contamination from the facility is conceivable during the life of the site. These dangers need identification and description in the EIR/EIS.

The Cady Mountains and surrounding lands possess a great wealth of cultural artifacts and resources which must be protected. The EIR/EIS needs to consider issues related to Indian tribes which inhabited the area, including all aboriginal trails, lithic scatters, rock shelters, camp sites, etc. of the 33 known cultural resource sites.

Due to the nature of the project the geological resources involved are of paramount concern. Analysis of surface and subsurface soils, as well as rock types, porosity, geologic history and local faults is essential. Within this analysis should be an inventory of mining resources in the project area, claims held and their status, and the impacts that the proposed specific hazardous waste facility will have on existing claims and potential mineral resources.

The Cady Mountains WSA is extremely large and within very easy reach of the growing desert center of Barstow/Daggett. In addition, it is particularly accessible to urban visitors from Los Angeles via Interstate 40 on the south and Interstate 15 making it an important recreational resource. Outstanding opportunities exist for unconfined recreation, a feeling of isolation and solitude, and excellent rockhounding. The proposed hazardous waste facility by HVR will seriously threaten the primeval nature of the Cady Mountains WSA by causing, air, water, wildlife, noise, and visual degradation to its naturalness. The EIR/EIS must embody a detailed study of the impacts this project will have on recreational values in the area.

Again, thank you for the opportunity submit scoping comments for the draft EIR/EIS. Please send us a copy of the document when it is available and keep us informed as new issues arise.

Sincerely,

Joan Reiss
Regional Director

Michael Gonella
Public Lands Analyst

cadymtns/mg1

United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VA 22092

October 29, 1990

Sharon Paris
Bureau of Land Management
Barstow Resource Area
150 Coolwater Lane
Barstow, CA 92311

Dear Ms. Paris:

This is in reference to your letter addressed to George Gryc of our Menlo Park office, dated Oct 25, 1990 (Ref: CACA 24320, 8500 WSA #251, 2800 (CA-068.21)).

The U. S. Geological Survey does not wish at this time to participate in the EIR/EIS for the Cady Mountains hazardous waste facility. We would, however, like to be informed of announcements of future scoping meetings so that we can re-evaluate our interest in participation at that time.

Please address future correspondence and meeting notices to Chief, Environmental Affairs Program, 423 National Center, U. S. Geological Survey, Reston, VA. 22092.

Clifford A. Haupt
Chief, Environmental Affairs
Program

ORRICK, HERRINGTON
& SUTCLIFFE

Direct Dial

(213) 680-7012

October 4, 1990

Sharon Paris
Environmental Coordinator
Bureau of Land Management
150 Coolwater Lane
Barstow, California 92311

Re: Proposed Hazardous Waste
Facility in Cady Mountains

Dear Ms. Paris:

Please put me on the mailing list to receive any documents issued in this matter, including the draft EIS.

Very truly yours,

W. Douglas Kari

WDK:de

333 South Hope Street • Los Angeles, California 90071
Telephone 213 680 7000 • Facsimile 213 680 4600
San Francisco 415 392 1122 • New York 212 326 8800 • Sacramento 916 447 9200

3142k

Greiner

Greiner, Inc.
2219 York Road, Suite 200
Timonium, Maryland 21093-3111
(301) 561-0100

October 5, 1990

Bureau of Land Management
Barstow Resource Area
150 Coolwater Lane
Barstow, California 92311

Attention: Ms. Sharon Paris

Gentlemen:

Reference: EIR/EIS for Proposed Specified Hazardous Waste Facility
[CA-060-00-5101-09-XBHA; CACA 24326]

As per publication in the September 28, 1990 Federal Register [Volume 55, No. 189], please place my name on the mailing list for receipt of the subject EIR/EIS.

Thank you for your cooperation.

Very truly yours,

GREINER, INC.

Frank Patrick III
Airport/Environmental Planner

FP:slm

(NON-PROFIT ORGANIZATION)

WESTERN MINING COUNCIL, Inc.

OFFICE OF THE PRESIDENT
2051 Pacific Avenue, Norco, CA 91760 (714) 737-6493

RECEIVED
NOV 19
BARSTOW RESOURCE AREA
BARSTOW, CA

November 6, 1990

Sharon Paris
Barstow Resource Area
Bureau of Land Management
150 Coolwater Lane
Barstow, CA 92311

Re: Hidden Valley Resources, Cady Mountains Hazardous Waste Disposal

Dear Ms. Paris,

Relative to the above, please add our name to the mailing list for the DEIR/EIS for this project.

Mailing address;

Gregory P. Ouellette, President
Western Mining Council, Inc.
2051 Pacific Avenue
Norco, CA 91760

Thank you,

Gregory P. Ouellette
President

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
BARSTOW RESOURCE AREA
150 COOLWATER LANE
BARSTOW, CALIFORNIA 92311-3221

(619) 256-3591

IN REPLY REFER TO

CACA 24320
8500 WSA #251
2800(CA-068.21)

SEP 28 1990

Memorandum

To: Supervisor, U.S. Fish and Wildlife Service
Attn: Ray Bransfield

From: Acting Area Manager, Barstow

Subject: Request for Species List

The BLM, in coordination with the County of San Bernardino, will prepare a joint EIR/EIS for a proposed specified hazardous waste facility in the Cady Mountains in the Western Mojave Desert of San Bernardino County. The applicant has applied to the County for approval of the facility which is proposed on private property. The BLM has received a right-of-way application from the applicant for access to the site for a road and a railroad spur across public lands.

Development of the hazardous waste facility is proposed in two phases involving private lands that total approximately 1,300 acres with an estimated storage capacity of 120 years. The facility is designed to receive, identify, categorize, and store dry, treated, stabilized hazardous waste. The containment and storage areas would consist of several underground steel or concrete storage containers. Once filled to capacity, the containers would be sealed and capped and the surface area recontoured and revegetated. It is estimated that the facility would receive and transfer approximately 30 to 50 rail car and 10 to 15 truck loads of material per day.

The right-of-way for access and utilities is proposed from Interstate 40 at the Hector exit to the site in Hidden Valley approximately 10 miles to the north. A two-lane paved road and a railroad spur line from Hector would provide access.

The environmental consultant, Chambers Group, Inc., will be preparing a biological assessment for the desert tortoise as well as the EIR/EIS under the direction of the BLM and the County.

Please provide a list of any additional listed or proposed species that may be present in the area of the proposed action.

We anticipate completion of the biological assessment in November 1990 and consultation initiated in December 1990.

Any questions may be directed to Sharon Paris, Environmental Coordinator of this office.

cc:
Ed Lorentzen (CA-932), CSO T&E Cord.
Paul Kielhold, County of San Bernardino
Martha Sanera, County of San Bernardino
Brian Patrick, Hidden Valley Resources, Inc.
Linda Brody, Chambers Group

TAKE PRIDE IN AMERICA

Dan Sasseville

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
SOUTHERN CALIFORNIA FIELD STATION
Ventura Office
2140 Eastman Avenue, Suite 100
Ventura, California 93003

October 10, 1990

Memorandum

To: Acting Area Manager, Bureau of Land Management, Barstow Resource Area, Barstow, California

From: Acting Office Supervisor

Subject: Threatened and Endangered Species in the Cady Mountains, San Bernardino County, California (CACA 24320 8500 WSA #251 2800(CA-068.21)) (1-6-90-SP-V288)

This is in response to your memorandum, dated September 28, 1990 and received by us on October 4, 1990 requesting information on listed and proposed endangered and threatened species which may be present within the area proposed for development of a hazardous waste facility in the Cady Mountains of San Bernardino County, California.

If the Bureau of Land Management (Bureau) project may affect a listed species, the Bureau has the responsibility to prepare a Biological Assessment if the project is a construction project which may require an Environmental Impact Statement[1/]. If a Biological Assessment is not required, the Bureau still has the responsibility to review its proposed activities and determine whether the listed species may be affected.

During the assessment or review process, the Bureau may engage in planning efforts, but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of Section 7(d) of the Endangered Species Act. If a listed species may be adversely affected, the Bureau should request, in writing through our office, formal consultation pursuant to Section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to listed species prior to a written request for formal consultation.

I have attached a list of threatened species and candidate species presently under review by the Fish and Wildlife Service for consideration for Federal listing (Attachment). Only listed species receive protection under the Act. However, candidate

species should be considered in the planning process in the event they become listed or proposed for listing prior to project completion. Preparation of a biological assessment, as described in Section 7(c) of the Act, is not required. They are included for the sole purpose of notifying Federal agencies in advance of possible proposals and listings which at some time in the future may have to be considered in planning Federal activities. If early evaluation of the project indicates that it is likely to adversely affect a candidate species, you may wish to request technical assistance from the Service.

If you have any questions, please contact Ray Bransfield of my staff at FTS 983-6040 or (805) 644-1766.

Attachment

LISTED AND CANDIDATE ENDANGERED AND THREATENED SPECIES
THAT MAY OCCUR WITHIN THE CADY MOUNTAINS,
SAN BERNARDINO COUNTY, CALIFORNIA
1-6-90-SP-V288

Listed Species

Reptile		
Desert tortoise	Gopherus agassizii	T

Candidate Species

Mammals		
Mexican long-tongued bat	Choenycteris mexicana	2
California leaf-nosed bat	Macrotus californicus	2
Spotted bat	Euderma maculatum	2
Greater western mastiff-bat	Eumops perotis californicus	2
Occult little brown bat	Myotis lucifugus occultus	2
Southwestern cave myotis	Myotis velifer brevis	2
Bird		
Ferruginous hawk	Buteo regalis	2

(E)-Endangered (T)-Threatened (CH)-Critical Habitat
(1)-Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
(2)-Category 2: Taxa which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
(3)-Category 3(c): Taxa more common than previously thought, no longer being considered for a listing proposal at this time.

APPENDIX B

GEOLOGIC - ROCK AND MAGNETOMETER DATA

APPENDIX B - GEOLOGIC - ROCK AND MAGNETOMETER DATA

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MAGNETOMETER SURVEY

GENERAL

As a part of the investigative process for preparation of the EIR, Chambers Group, Inc. conducted a magnetometer survey of the Hidden Valley project area. This survey was conducted, in the field, from July 31, 1990 to August 3, 1990.

The magnetometer study was undertaken in an effort to gain information as to bedrock types under the valley floor and at the same time, determine if any indications of faulting could be discerned from the data. Since a couple of small faults have been mapped outside the area of Hidden Valley, it was felt necessary to explore the potential of hidden faults beneath the alluvial materials in the valley.

PROCEDURES

An EG & G Geometrics proton magnetometer Model No. G-856 was used to acquire the raw field data readings. This model magnetometer has a field resolution to 0.1 gamma. This model has an RS-232 port which allows the direct transfer of data from the units memory banks directly into a computer for processing and corrections.

Field stations were established on a 0.5 mile grid system to coincide with the established field survey system. A base station was set up at datum point No. 22 to acquire base readings for later data corrections. This base station was utilized throughout the field mapping.

All field data were brought back to Chamber's offices for correction and plotting. The raw data had diurnal, time, temperature and location corrections made prior to plotting. The program used for corrections was the MAGPAC Version 4.1 Magnetic Data Processing and Interpretation Program.

After all data had been corrected, it was then processed with a data processing program known as Surfer (Version 4.0). The datum points were then contoured using the Kriging Method. Figure 3.1-4 is the corrected magnetic data contour plot.

RESULTS

The two magnetic highs on the north (reference A) appear to be extensions of the basaltic fanglomerates found in the hills on the north edge of the valley. The data reflect the extension of these units under the valley floor. Higher magnetic readings could be expected in these areas due to the concentration of magnetite and other iron bearing minerals found in the fanglomerates.

The low readings found in the area of reference B reflect a deepening of the alluvial fill in that

area. It appears that the fault indicated southeast of that location (Dibble and Bassett, 1966) continues on out into the valley at reference B. As a result of the faulting, the valley floor is deeper there and does not reflect a normal erosional magnetic gradient.

The large area referenced as C represents a reflection of the quartz monzonite found on the up thrown side (south) of the Cady fault. The general lack of high magnetic readings is a reflection of the lack of iron bearing minerals in the quartz monzonite and the deeper buried character of the unit on the down thrown side of the fault.

Reference area D is a reflection of the andesite flows found on the surface on the south side of the Cady fault. These rocks have been faulted down on the north side of this fault and exhibit higher magnetic properties in that area due to the greater concentration of iron bearing minerals in the unit. The unit appears to drop off rapidly suggesting that the fault has tilted the unit slightly up in the southerly direction. The lower values encountered at reference E probably indicate an later zone in the andesite flows.

The general areas of lows on the west side of the HVR area and the sharp change in readings on the west side of areas E & F indicate the presence of a potential fault. This suggested alignment is in direct line with the fault that has been mapped in Section 30, on the north side of the valley (see Figure 3.1-2).

The balance of the area, reference G, presents a picture of relatively uniform, low magnetic gradient alluvial valley floors. There is no confirmation of a deepening of the basin in the SW corner of Section 33, where the gravity data indicated a very thick alluvial section (580 feet).

INDEX OF LITHOLOGIC UNITS - HIDDEN VALLEY AREA

MESOZOIC ROCKS

The Mesozoic rocks are found on the southeast side of the HVR site in Hidden Valley. They consist of a series of granites, quartz monzonites and aplite dikes.

Granite

The granites found in the easter portion of the area are hard, massive units composed of quartz, feldspar and less than 1 percent biotite. In most of the area the biotite has been altered to iron oxides. The feldspars are mostly potassic and perthite with a small percentage of plagioclase feldspar. Generally there is less than 1 percent accessory minerals which are sphene, apatite, zircon and magnetite.

Quartz Monzonite

These rocks are very similar to the granites described above with the exception of more quartz and a predominance of potassic feldspar over plagioclase feldspar. Rocks in this unit are medium to coarse-grained and light gray in color. The unit has been dated by using a led-alpha method on some zircon. The dates indicated an age of 115 million years.

Aplite Dikes

In a few areas the granites and quartz monzonites are intruded by aplite dikes. These dikes are composed of gray-white, massive, fine-grained feldspar and quartz with minute amounts of mica. They are thought to be a dike facies of the granites that they intrude.

CENOZOIC ROCKS

The majority of the rocks found in the mountains around the Hidden Valley site are volcanics of Upper Oligocene or Lower Miocene age. Most are basalts and andesites. These volcanics occur as plugs, pods and dikes intrusive through the pre-Tertiary rocks and into Tertiary volcanics. They probably filled the vents and fissures through which the flows of this Tertiary assemblage erupted.

Andesite (Intrusive)

These rocks are light-pinkish, brownish to greenish-gray, massive to flow-banded, with local variations to latite, dacite or quartz latite. The rocks are felsitic to slightly porphyritic or aphanitic. In some places they contain small phenocrysts of plagioclase, biotite, hornblende and quartz.

Andesite Porphyry (Intrusive)

Porphyritic andesites are found in the entire area. These rocks are typically brownish to greenish-gray, massive (rarely flow-laminated) with local variations to latite. They have abundant phenocrysts of plagioclase feldspar and occasionally plates of biotite and needles of basaltic hornblende. The groundmass is microcrystalline plagioclase, potassic feldspar and iron oxides.

Andesite Porphyry (Altered Intrusives)

The rocks of this unit are hydrothermally leached and altered andesite porphyry as described above. They have been altered to a light buff, softer rock with the feldspars partly altered to kaolinite. The iron content of the rocks has been leached out.

Basalt (Intrusive)

The intrusive basalts found in the area are typically black, massive, finely crystalline rocks composed of gray plagioclase feldspar, pyroxene and iron oxides. They do exhibit scattered phenocrysts of olivine.

Andesite (Volcanic Flows)

Andesite flows produce greenish-gray, brown to dark-reddish/brown, massive porphyritic units. These rocks frequently have phenocrysts of plagioclase feldspar and occasionally sanidine feldspar. Andesite lavas are found in thick flows and in many areas the flows grade into andesitic breccias. When breccias are found, they are crudely layered and often grade into fanglomerates of andesitic rocks.

Basalt (Volcanic)

Basalt lava flows are very common in the Hidden Valley area. They consist of dark-gray to black, massive to finely crystalline rocks composed of gray calcic plagioclase, glasses, pyroxenes, olivine, magnetite and in some instances, phenocrysts of olivine. Amygdules of calcite, quarts, chalcedony and opal are common in the area.

The basalt flows in the study area are found to grade into basalt (flow) breccias and fanglomerates with basalt fragments as large as 3 feet in diameter.

Fanglomerates

There are numerous fanglomerates developed in the general area. Both andesitic and basaltic fanglomerates are common. These rocks were deposited as alluvial outwash of detritus eroded from the Tertiary basalts and andesites, both intrusive and flows. The units are normally massive to crudely bedded and consist of unsorted sub-rounded to angular fragments of rocks as large as 3 feet in diameter.

PLEISTOCENE TO RECENT SEDIMENTS

There are massive amounts of unconsolidated clays, silts, sands and gravels deposited in the valleys and low lying portions of the study area. These sediments are the result of erosion on the surrounding rocks which results in sands and gravels of arkosic nature. The sediments are deposited as stream sediments, valley fills and alluvial fans.

The windblown sands that cover the area are composed of primarily quartz, feldspar and mica. These sands form elongated sand dunes and thin, loose cover on the valley floors.

Clays that are found in the area are generally light-gray and it is common to have micaceous silts with alkaline efflorescences.

Basalts known as the Pisgah flow are found in the southwest portion of the project area. These basalts are black, vesicular, hard, microcrystalline rocks, composed of dark-gray calcic plagioclase, glass pyroxene and magnetite. Some phenocrysts of olivine are found. The source of this flow was the Pisgah Crater to the south of the Hidden Valley area. The flow has been dated as very late Pleistocene or Recent.

APPENDIX C

HYDROLOGIC DATA

APPENDIX C - HYDROLOGIC DATA

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APPENDIX C - HYDROLOGY

In order to assess the potential affects of a 10-year and 100-year storm, the following factors must be considered and evaluated:

- Precipitation
- Runoff potential
- Hydrologic soil groups
- Antecedent moisture condition
- Infiltration rates & storm loss rates

Precipitation

Hidden Valley is located in one of the most arid regions of the United States. The annual precipitation is approximately 4 inches and the annual evaporation rate is 140 inches. The San Bernardino County Hydrology Manual (1986) contains Isohyetal maps which show places of equal rainfall depth for various return periods and durations. Statistical data for the Hidden Valley area that has been abstracted from the Hydrology Manual figures and is shown as follows:

Map Numbers from SBCo Hydrology Manual	Return Period (Years)	Storm Duration (Hours)	Rainfall Density (inches/hour)	
			Mountain Area	Valley Area
B-7	2	6	0.8	0.7
B-7	2	24	1.2	1.0
B-9	10	1	0.8	0.8
B-10	100	1	1.3	1.2
B-11	100	6	2.0	1.8
B-12	100	24	3.5	3.0

Intensity-duration curves for the Hidden Valley area were developed based on the "Intensity-Duration Curves Calculation Sheet," which is Figure D-3 of the Hydrology Manual, using a slope of 0.7.

Run-off Potential

The valley floor has surface slopes that vary from flat to 10 percent near the mountains. Areas with slopes less than 5 percent appear generally to be areas of deposition with natural drainage channels whereas areas between 5 percent and 10 percent surface slopes appear generally to be areas of slight to moderate erosion. Areas with surface slopes over 10 percent are erosive with well-defined natural drainage channels.

The steeper mountainous slopes are areas of relative high runoff potential compared to the flatter and more gently sloping areas of the valley. Steep slopes facilitate rainfall channelization and high runoff coefficient because of low infiltration rates.

The HVR site consists of about 53.9 percent flat to gently sloping areas (5 percent slope); 23.6 percent gently sloping (6 percent to 10 percent slope) and 22.5 percent moderate to steep (over 10 percent slope).

Hydrologic Soil Groups

The surface soils in the valley-floor areas are typically silty sands and silty sands with gravel. They have been classified "SM" in accordance with the Uniform Soils Classification System. These soils cover over 50 percent of the western half of the valley and some portions of the eastern half of the valley.

Using the Hydrology Manual, these soils have been categorized as hydrologic soils Group B which are "Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained, sandy-loam soils with moderately fine to moderately coarse textures with a moderate rate of water transmission."

The balance of the valley, except for the playa surface, is classified as soil Group C, defined as having slow infiltration rates when thoroughly wetted and a slow rate of water transmission. The playa surface itself is classified as hydrologic soil Group D, as described above.

The mountains surrounding Hidden Valley are generally steep and barren with little soil development. The percolation properties of these areas are described as hydrologic soil Group D. These soils have high runoff potential and a very slow rate of water transmission.

Antecedent Moisture Condition

Antecedent moisture condition (AMC) is that moisture that is already in the ground prior to the rainfall event in question. AMC is divided by the Hydrology Manual into 3 specific classes as follows:

- AMC I - Lowest runoff potential. The watershed soils are dry enough to allow satisfactory grading or cultivation to take place.

- **AMC II** - Moderate runoff potential; an average study condition.

- **AMC III** - Highest runoff potential. The watershed is practically saturated from antecedent rains. Heavy rainfall or light rainfall and low temperatures have occurred with the last five days.

The Hydrology manual requires for design purposes that AMC II be used for 10-year return frequency storms and AMC III be used for 100-year return frequency storms.

It must be noted that in the Hidden Valley region, the storms that produce the highest peak-flows are high intensity, short-duration events, more likely occurring in August or September. Since temperatures normally exceed 100 degrees at that time and the winds are strong, evaporation rates significantly reduce the potential of the site being saturated from antecedent rains.

Estimates by the National Weather Service indicate that the average annual Class A pan evaporation is over 140 inches per year for the HVR project area.

Infiltration Rates and Storm Loss Rates

Infiltration rates for the soils are derived from laboratory studies and presented in the Hydrology Manual (SBCo, 1986). Measurements show that an initially dry soil will have an associated infiltration rate which decreases with time as the soil becomes wetted. As a soil is subjected to continual heavy rainfall, the infiltration rate approaches a minimum (usually within about 30 minutes) which represents the true infiltration capacity of the soil.

Stream gage information is not available for Hidden Valley drainage. Site specific infiltration rates for such areas can be estimated by using curve numbers (CN) from Figures C-3 and C-6 of the Hydrology Manual.

Using hydrologic soil Group C for the valley area, hydrologic soil Group D for the mountains, poor soil cover and antecedent moisture condition AMC III, the pervious infiltration rate differed only slightly from impervious surfaces (i.e., pavement) The infiltration rates for a 100-yr storm event at the HVR site are 0.04 inches/hour for the mountains and 0.06 inches/hour for the valley.

APPENDIX D

PLANT AND WILDLIFE SPECIES LIST

APPENDIX D - PLANT AND WILDLIFE SPECIES LIST

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OBSERVED PLANT SPECIES

Key:
+ = Observed in Chambers Group, Inc. 1990 Survey.
• = Observed in J & M Land Restoration, Inc. 1988 Survey.

Family/Species			Common Name
AGAVACEAE			**AGAVE FAMILY**
Yucca brevifolia		+	Joshua tree
Yucca schidigera	•	+	Mojave yucca, Spanish dagger
ASTERACEAE			**SUNFLOWER FAMILY**
Ambrosia acanthicarpa	•		Burweed
Ambrosia dumosa	•	+	bursage or burrobush
Amphipappus fremontii	•		chaff bush
Baileya pleniradiata	•	+	woolly marigold
Bebbia juncea	•	+	sweetbush
Brickellia arguta	•		spear-leaved brickellia
Brickellia desertorum	•	+	desert brickellia
Chaenactis fremontii	•		Fremont pincushion
Chaenactis stevioides	•		Esteve pincushion
Chrysothamnus paniculatus		+	sticky-leaved rabbitbush
Encelia farinosa	•	+	brittlebush
Encelia frutescens	•	+	bush encelia
Erigeron sp.		+	fleabane
Eriophyllum wallacei	•	+	Wallace's yarrow
Geraea canescens	•		desert sunflower
Gutierrezia sarathrea	•		common match weed
Happlopappus cuneatus	•		desert rock golden bush
Happlopappus goodingii	•		spiny goldenbush
Hoffmeisteria pluriseta	•		arrow-leaf
Hymenoclea salsola	•	+	cheesebush
Machaeranthera leucanthemifolia	•		machaeranthera
Machaeranthera tortifolia	•	+	desert aster
Malacothrix coulteri	•		snake's head
Malacothrix glabrata	•	+	desert dandelion
Monoptilon bellioides	•	+	Mojave desert-star
Pectis papposa	•		chinch weed
Perityle emoryi	•		Emory rock daisy
Peucephyllum schottii	•		pigmy cedar
Rafinesquia neomexicana	•		desert chicory
Stephanomeria pauciflora	•		few-flowered stephanomeria

OBSERVED PLANT SPECIES

Key:
+ = Observed in Chambers Group, Inc. 1990 Survey.
• = Observed in J & M Land Restoration, Inc. 1988 Survey.

Family/Species	Common Name
BORAGINACEA	**BORAGE FAMILY**
Amsinckia tessellata	• + checker fiddleneck
Coldenia plicata	• + plicate coldenia
Cryptantha pterocarya	• wing-nut forget-me-not
Pectocarya recurvata	• + arched-nutted comb-bur
BRASSICACEAE	**MUSTARD FAMILY**
Descurainia pinnata	• tansy mustard
Dithyrea californica	• spectacle pod
Lepidium fremontii	• + desert alyssum
Lepidium nitidum var. *howellii*	• + shining peppergras
Thelypodium lasiophyllum var. *utahense*	• California mustard
CACTACEAE	**CACTUS FAMILY**
Echinocactus polycephalus	• + cottontop cactus
Echinocereus engelmannii	• hedgehog cactus
Mammalaria tetrancistra	• + corkseed cactus
Opuntia basilaris	• + beavertail cactus
Opuntia bigelovii	• + jumping cholla
Opuntia ramosissima	• + pencil cholla
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
Atriplex confertifolia	• + shadscale
Atriplex hymenelytra	+ desert holly
Atriplex polycarpa	• desert saltbush
Grayia spinosa	• hop sage
EPHEDRACEAE	**EPHEDRA FAMILY**
Ephedra californica	• + Mormon tea
EUPHORBIACEAE	**SPURGE FAMILY**
Croton californicus var. *mohavensis*	• + desert croton
Euphorbia micromera	• + desert spurge

OBSERVED PLANT SPECIES

Key:
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Family/Species	Common Name
FABACEAE	**PEA FAMILY**
Acacia greggii	● + catclaw acacia
Astragalus sp.	● locoweed
Cassia armata	● + desert cassia
Dalea fremontii var. *minutifolia*	● fremont dalea
Dalea spinosa	● + smoke tree
Lupinus shockleyi	● + Shockley lupine
Prosopis glandulosa	+ mesquite
GERANIACEAE	**GERANIUM FAMILY**
Erodium cicutarium	● red-stemmed filaree
Erodium texanum	● + desert heron's bill
HYDROPHYLLACEAE	**WATERLEAF FAMILY**
Nama demissum	● purple mat
Phacelia crenulata	● crenata phacelia
Phacelia tanacetifolia	● tansy phacelia
KRAMERIACEAE	**KRAMERIA FAMILY**
Krameria parvifolia	● + little-leaved rattany
LAMIACEAE	**MINT FAMILY**
Salazaria mexicana	● bladder sage
Salvia columbariae	● chia
Salvia mojavensis	● mojave sage
LENNOACEAE	**LENNOA FAMILY**
Pholisma arenarium	● + desert Christmas tree, scaly-stemmed sand plant
LOASACEAE	**LOASA FAMILY**
Mentzelia albicaulis	● small-flowered blazing star
Mentzelia involucrata	● sand blazing star
Mentzelia nitens	● shining stick-leaf
Mentzelia veatchiana	● + veatch's stick-leaf
Petalonyx thurberi	● + Thurber sandpaper plant
MALVACEAE	**MALLOW FAMILY**
Malvastrum rotundifolium	● + desert five-spot
Sphaeralcea ambigua	● + desert mallow

OBSERVED PLANT SPECIES

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• = Observed in J & M Land Restoration, Inc. 1988 Survey.

Family/Species	Common Name
NYCTAGINACEAE	**FOUR-O'CLOCK FAMILY**
Abronia villosa	• + hairy sand-verbena
Mirabilis bigelovii	• + wishbone bush
ONAGRACEAE	**EVENING-PRIMROSE FAMILY**
Oenothera brevipes	• yellow cups
Oenothera deltoids	• dune primrose
Oenothera clavaeformis	• clavate-fruited primrose
PAPAVERACEAE	**POPPY FAMILY**
Eschscholzia minutiflora	• + little gold-poppy
PLANTAGINACEAE	**PLANTAIN FAMILY**
Plantago insularis var. *fastigiata*	• + woolly plantain
POACEAE	**GRASS FAMILY**
Bromus rubens	• red brome
Hilaria rigida	+ galleta grass
Oryzopsis hymenoides	+ Indian rice grass
Poa scabrella	• pine bluegrass
Schismus arabicus	• Arabian bluegrass
Stipa speciosa	+ desert needlegrass
Tridens pulcherlus	• fluff grass
POLEMONIACEAE	**PHLOX FAMILY**
Eriastrum (eremicum?)	• eriastrum
Gilia latiflora	• + broad-flowered gilia
Langloisia matthewsii	+ desert calico
Langloisia punctata	• + spotted langloisia
Linanthus Aureus	• golden linanthus

OBSERVED PLANT SPECIES

Key:
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● = Observed in J & M Land Restoration, Inc. 1988 Survey.

Family/Species	Common Name
POLYGONACEAE	**BUCKWHEAT FAMILY**
Chorizanthe brevicornu	● + brittle spineflower
Chorizanthe rigida	● rigid-spiny-herb
Eriogonum brachyanthum	● sort-flowered eriogonum
Eriogonum deflexa	+ skeleton weed
Eriogonum fasciculatum var. *polifolium*	● + California buckwheat
Eriogonum inflatum	● + desert trumpet
Eriogonum pusillum	● yellow turban
Eriogonum trichopes	● yellow trumpet
ROSACEAE	**ROSE FAMILY**
Prunus fasciculata	● + desert almond
SCROPHULARIACEAE	**FIGWORT FAMILY**
Penstemon sp.	● penstemon
SOLANACEAE	**NIGHTSHADE FAMILY**
Lycium andersonii	● Anderson desert thorn
Nicotiana trigonophylla	● desert tobacco
Physalis crassifolia	● + thick-leaved ground cherry
VISCACEAE	**MISTLETOE FAMILY**
Phoradendron californicum	+ desert mistletoe
ZYGOPHYLLACEAE	**CALTROP FAMILY**
Larrea tridentata	● + creosote bush

WILDLIFE SPECIES LIST

KEY	
Occurrence: OBS - Observed EXP - Expected REP - Reported POSS - Of possible occurrence POSS? - Remotely possible	**Habitat:** Mojave desert scrub

Class	Order	Species Name	Common Name	Occurrence
REPTILES	Testudines	*Gopherus agassizii*	desert tortoise	OBS
	Squamata-Lizards and Snakes	*Coleonyx variegatus*	Western banded gecko	EXP
		Uta stansburiana	side-blotched lizard	OBS
		Callisaurus draconoides	zebra-tailed lizard	OBS
		Crotaphytus insularis	desert collared lizard	EXP
		Dipsosaurus dorsalis	desert iguana	POSS
		Gambelia wislizenii	long-nosed leopard lizard	POSS
		Urosaurus graciosus	long-tailed brush lizard	EXP
		Phrynosoma platyrhinos	desert horned lizard	EXP
		Sauromalus obesus	chuckawalla	POSS
		Leptotyphlops humilis	western blind snake	POSS
		Lichanura trivirgata	rosy boa	POSS
		Masticophis flagellum	coachwhip	EXP
		Salvadora hexalepis mojavensis	Mojave patch-nosed snake	EXP
		Arizona elegans	glossy snake	EXP
		Pituophis melanoleucus	gopher snake	EXP
		Lampropeltis getulus	common kingsnake	EXP
		Rhinocheilus lecontei	long-nosed snake	EXP
		Sonora semiannulata	ground snake	POSS

WILDLIFE SPECIES LIST

KEY				
Occurrence: **OBS - Observed** **EXP - Expected** **REP - Reported** **POSS - Of possible occurrence** **POSS? - Remotely possible**			**Habitat: Mojave desert scrub**	
REPTILES (Continued)	Squamata-Lizards and Snakes (Continued)	*Chianactis occipitalis*	western shovel-nosed snake	EXP
		Trimorphodon biscutatus	California lyre snake	POSS
		Hypsiglena torquata	night snake	EXP
		Crotalus cerastes	sidewinder	EXP
		Crotalus mitchelli	speckled rattlesnake	POSS
		Crotalus scutulatus	Mojave rattlesnake	
BIRDS	Falconiformes - Vultures, Hawks, Ospreys and Falcons	*Cathartes aura*	turkey vulture	OBS
		Accipiter striatus	sharp-shinned hawk	POSS
		Buteo jamaicensis	red-tailed hawk	EXP
		Buteo swainsoni	Swainson's hawk	POSS
		Buteo regalis	ferruginous hawk	POSS
		Buteo lagopus	rough-legged hawk	POSS
		Aquila chrysaetos	golden eagle	EXP
		Circus cyaneus	Northern harrier	POSS
		Falco mexicanus	prairie falcon	EXP
		Falso sparverius	American kestrel	POSS
	Galliformes-Gallinaceous Birds	*Callipepla gambelii*	Gambel's quail	EXP
	Columbiformes-Pigeons and doves	*Zenaida macroura*	mourning dove	EXP
	Cuculiformes-Cuckoos and Roadrunners	*Geococcyx californianus*	roadrunner	OBS

WILDLIFE SPECIES LIST

KEY				
Occurrence:	**OBS - Observed** **EXP - Expected** **REP - Reported**	**POSS - Of possible occurrence** **POSS? - Remotely possible**	**Habitat: Mojave desert scrub**	
BIRDS (Continued)	Strigiformes-Owls	*Tyto alba*	barn owl	POSS
		Bubo virginianus	great horned owl	EXP
		Athene cunicularia	burrowing owl	POSS
	Caprimulgiformes-Goatsuckers	*Chordeiles acutipennis*	lesser nighthawk	EXP
		Phalaenoptilus nuttallii	common poor will	EXP
	Apodiformes-Swifts and Hummingbirds	*Chaetura vauxi*	Vaux's swift	EXP
		Aeronautes saxatalis	white-throated swift	EXP
		Archilochus alexandri	black-chinned hummingbird	POSS
		Calypte costae	Costa's hummingbird	EXP
		Calypte anna	Anna's hummingbird	OBS
		Selasphorus rufus	rufous hummingbird	POSS?
	Piciformes-Woodpeckers and Allies	*Colaptes auratus*	northern flicker	EXP
		Picoides scalaris	ladder-backed woodpecker	POSS
	Passerformes-Perching Birds	*Tyrannus verticalis*	western kingbird	EXP
		Myiarchus cinerascens	ash-throated flycatcher	EXP
		Sayornis saya	Say's phoebe	POSS
		Empidonax difficilis	Pacific slope flycatcher	POSS
		Contopus borealis	olive-sided flycatcher	POSS?
		Contopus sordidulus	western wood peewee	POSS
		Empidonax wrightii	gray flycatcher	POSS

WILDLIFE SPECIES LIST

KEY				
Occurrence: **OBS - Observed** **EXP - Expected** **REP - Reported** **POSS - Of possible occurrence** **POSS? - Remotely possible**			**Habitat: Mojave desert scrub**	
BIRDS (Continued)	Passerformes-Perching Birds (Continued)	*Eremophila alpestris*	horned lark	EXP
		Tachycinetta thalassina	violet-green swallow	POSS
		Stelgidopteryx serripennis	northern rough-winged swallow	POSS
		Petrochelidon pyrrhonota	cliff swallow	POSS?
		Corvus corax	common raven	EXP
		Psaltriparus minimus	bushtit	POSS
		Auriparus flaviceps	verdin	EXP
		Salpinctes obsoletus	rock wren	POSS
		Campylorhynchus brunneicapillus	cactus wren	EXP
		Regular calendula	ruby-crowned kinglet	POSS?
		Polioptila melanura	black-tailed gnatcatcher	EXP
		Mimus polyglottos	mockingbird	EXP
		Toxostoma crissale	crissal thrasher	POSS
		Toxostoma lecontei	LeConte's thrasher	EXP
		Toxostoma bendirei	Bendire's thrasher	POSS
		Turdus migratorius	American robin	POSS?
		Catharus guttatus	hermit thrush	POSS
		Catharus ustulatus	Swainson's thrush	POSS
		Phainopepla nitens	phainopepla	EXP
		Lanius ludovicianus	loggerhead shrike	POSS?

WILDLIFE SPECIES LIST

KEY				
Occurrence: OBS - Observed POSS - Of possible occurrence EXP - Expected POSS? - Remotely possible REP - Reported			**Habitat:** Mojave desert scrub	
BIRDS (Continued)	Passerformes-Perching Birds (Continued)	*Sturnus vlgaris*	starling	POSS
		Vireo huttoni	Hutton's vireo	POSS
		Vireo vicinior	gray vireo	POSS
		Vireo solitarius	solitary vireo	EXP
		Vireo gilvus	warbling vireo	EXP
		Vermivora celata	orange-crowned warbler	POSS
		Vermivora ruficapilla	Nashville warbler	POSS?
		Vermivora luciae	Lucy's warbler	EXP
		Dendroica petechia	yellow warbler	POSS
		Dendroica nigrescens	black-throated gray warbler	POSS
		Dendroica coronata	yellow-rumped warbler	EXP
		Dendroica townsendi	Townsend's warbler	POSS
		Wilsonia pusilla	Wilson's warbler	EXP
		Pheucticus melanocephalus	black-headed grosbeak	POSS
		Guiraca caerulea	blue grosbeak	POSS
		Passerina amoena	lazuli bunting	POSS
		Passerculus sandwichensis	Savannah sparrow	EXP
		Pooecetes gramineus	vesper sparrow	EXP
		Amphispiza bilineata	black-throated sparrow	EXP
		Amphispiza belli	sage sparrow	EXP

WILDLIFE SPECIES LIST

KEY **Occurrence:** OBS - Observed POSS - Of possible occurrence EXP - Expected POSS? - Remotely possible REP - Reported			**Habitat: Mojave desert scrub**	
BIRDS (Continued)	Passerformes-Perching Birds (Continued)	*Spizella passerina*	chipping sparrow	POSS
		Spizella breweri	Brewer's sparrow	POSS
		Zonotrichia levocophrys	white-crowned sparrow	EXP
		Sturnella neglecta	western meadowlark	EXP
		Euphagus cyanocephalus	Brewer's blackbird	EXP
		Molothrus ater	brown-headed cowbird	EXP
		Icterus galbula	northern oriole	EXP
		Icterus cucullatus	hooded oriole	POSS
		Piranga ludoviciana	western tanger	POSS
		Spinus psaltria	lesser goldfinch	EXP
		Carpodacus mexicanus	house finch	EXP
MAMMALS	Insectivora-Insect Eaters	*Notiosorex crawfordi*	desert shrew	EXP
	Chiroptera-Bats	*Myotis californicus*	California myotis	EXP
		Pipistrellus hesperus	western pipistrelle	REP
		Plecotus townsendii	western big-eared bat	EXP
		Antrozous pallidus	pallid bat	EXP
	Carnivora-Flesh-Eaters	*Taxidea taxus*	badger	REP
		Canis latrans	coyote	OBS
		Vulpes macrotis	kit fox	EXP
		Lynx rufus	bobcat	POSS

WILDLIFE SPECIES LIST

KEY				
Occurrence: **OBS - Observed** **EXP - Expected** **REP - Reported** **POSS - Of possible occurrence** **POSS? - Remotely possible**			**Habitat: Mojave desert scrub**	
MAMMALS (Continued)	Carnivora-Flesh-Eaters (Continued)	*Felis concolor*	mountain lion	POSS?
	Rodentia-Gnawing Mammals	*Citellus tereticaudus*	roundtail ground squirrel	OBS
		Ammospermophilus leucurus	whitetail antelope squirrel	OBS
		Thomomys bottae	valley pocket gopher	OBS
		Perognathus longimembris	little pocket mouse	REP
		Perognathus penicillatus	desert pocket mouse	REP
		Perognathus formosus	longtail pocket mouse	POSS
		Dipodomys deserti	desert kangaroo rat	REP
		Dipodomys merriami	Merriam's kangaroo rat	REP
		Peromyscus eremicus	cactus mouse	REP
		Peromyscus crinitus	canyon mouse	EXP
		Peromyscus maniculatus	deer mouse	EXP
		Onychomys torridus	southern grasshopper mouse	POSS
		Neotoma lepida	desert woodrat	POSS
		Lepus californicus	blacktail jackrabbit	OBS
		Sylvilagus audubonii	desert cottontail	REP
	Artiodactyla-Hoofed Mammals	*Ovis canadensis nelsoni*	Nelson's bighorn sheep	REP

APPENDIX E

AIR QUALITY DATA

APPENDIX E1

DETAILED AIR QUALITY ANALYSIS

APPENDIX E1 - DETAILED AIR QUALITY ANALYSIS

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APPENDIX E1 - DETAILED AIR QUALITY ANALYSIS

Calculations for this analysis are presented in Appendix E2 following this section. The sections are numbered the same for ease of reference.

4.5 AIR QUALITY

4.5.1 Determination of Impact Significance Criteria

Air impacts stem mainly from construction activities and on- and off-site travel both during construction and operations. Air quality impacts are considered significant if they:

- Exceed daily emission criteria established by the San Bernardino County Air Pollution Control District (SBCAPCD) New Source Review (NSR). These are:

  - Carbon Monoxide 750 pounds/day
  - Nitrogen Oxides 250 pounds/day
  - Reactive Organics 250 pounds/day
  - Sulfur Oxides 250 pounds/day
  - Particulate Matter 250 pounds/day

  Note that in accordance with NSR and the impact criteria, these emissions only consider: 1) stationary on-site emissions, 2) on-premise vehicles, 3) the emissions for all cargo carriers (excluding motor vehicles) while operating within the air basin which load or unload at the source, and 4) all emissions resulting from the loading or unloading of cargo at the source (San Bernardino County Air Pollution Control District Regulation XIII, New Source Review, Rule 1306, July 21, 1980). Off-site emissions were calculated and are presented for information only.

- Result in emissions that exacerbate existing air quality conditions where air quality standards are already exceeded or result in exceedance of air quality standards.

- Violate SBCAPCD Rule 402 (Nuisance) or Rule 403 (Fugitive Dust).

Further, an impact is considered adverse, but not significant if it contributes to a condition which is detrimental to the regional airshed but is less than a level of significance. These latter impacts fall below the significance threshold and, though detrimental, need not be mitigated.

4.5.2 Proposed Action

The construction and facility operations would be performed in eight phases. These are summarized below:

- Phase 1 - Hector to facilities area access road construction
- Phase 2 - Facilities area to repository road construction
- Phase 3 - Facilities area civil construction and paving
- Phase 4 - Facilities area construction and repository excavation
- Phase 5 - Containment area construction and continuing repository excavation
- Phase 6 - Normal truck delivery operation with continuing containment area construction and repository excavation
- Phase 7 - Normal operation with railroad construction option and continuing containment area construction
- Phase 8 - Normal operation with truck and rail delivery, continuing containment area construction and repository excavation

Thus, Phases 1 through 5 are involved in the initial construction of the facility and are addressed in Section 4.5.2.1. Phase 6 is the initial operation (Section 4.5.2.2), Phase 7 (Section 4.5.2.3) includes initial operation with the simultaneous construction of a railroad spur line and Phase 8 (Section 4.5.2.4) includes subsequent operation.

4.5.2.1 Initial Construction

Impacts

Phases 1, 2 and 3

Exhaust Emissions

Phase 1 would involve the construction of approximately 10 to 14 miles of site access road depending upon the chosen alignment. Phases 2 and 3 include the extension of this road to the facilities and repository areas for on-site travel and parking. For all three phases the improvements would consist of 3 inches of asphaltic concrete over a 6-inch base. Road materials would be brought in from the Barstow area. The average daily traffic (ADT) for road construction is anticipated at 172 including 52 ADT for construction workers and 120 for heavy

trucks bringing in road materials. This assemblage is expected for the 69 days of access corridor and facility area construction.

Construction equipment would create exhaust pollutants from on-site earth movement and from equipment bringing concrete, asphalt and other building materials on-site. With regards to nuisance odors, any air quality impacts would be confined to the immediate vicinity of the equipment itself. By the time such emissions reach any sensitive receptor sites away from the project site, they would be diluted to well below any level of air quality concern. An occasional "whiff" of diesel exhaust from trucks accessing the site from public roadways could result. Such brief exhaust odors are an adverse, but not significant, air quality impact.

Grading and construction activities would consume diesel fuel and thus produce combustion by-products. The equipment to be used during construction would include two bull dozers, two scrapers, four graders and two rollers. These pieces are typically moved on-site and remain for the duration of construction. Daily fuel usage is calculated at 960 gallons per day.

Exhaust emissions would also be generated by workers commuting to the site. It is anticipated that as many as 26 workers would travel to the site from the Barstow area, a distance of about 35 miles, on a daily basis. Finally, haul trucks would be used to bring road materials to the site on a regular basis. These are also anticipated to emanate from the Barstow area. Table 4.5-1 gives the calculated on-site exhaust emissions for heavy equipment and off-site mobile emissions for materials deliveries and worker commutes for project development. Calculations are presented in Appendix E2.

As shown in Table 4.5-1, the construction of the access road and facilities area would neither exceed the SBCAPCD NSR levels nor the impact criteria for the various on-site regulated pollutant species. Thus, no significant impacts are anticipated.

Fugitive Dust

Site clearing, building and road construction and equipment travel on unpaved surfaces would generate considerable quantities of fugitive dust during project development. AP-42 predicts fugitive dust from civil construction at 1.2 tons per acre per month of activity (AP-42, 1988, Section 11.2.4). This value would vary with soil moisture, silt content, wind speed and several other factors. Through watering and other dust control measures, dust emission rates can be reduced by 50 percent.

Assuming a completed road width of 24 feet, the area of disturbance would be 30 feet wide by 1,170 feet long for a daily disturbance of 0.8 acres. This same area of disturbance would be used for Phases 1, 2 and 3. Based upon the 0.8 acre per day working schedule, 169.6 pounds of PM-10 dust would be generated per day with twice daily watering. This value when combined with PM-10 particulate matter due to exhaust emissions from on-site construction totals 181.7 pounds daily and, though adverse, is insignificant.

Table 4.5-1

PROJECT CONSTRUCTION AIR POLLUTION EMISSIONS FOR HEAVY EQUIPMENT AND WORKER COMMUTING INVOLVED IN THE CONSTRUCTION OF THE HVR FACILITY WITH REPOSITORY EXCAVATION (PHASES 1, 2 AND 3)

Pollutant	Prop[2]	SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
On-Site Exhaust Emissions			
Carbon Monoxide	37.3	750	No
Nitrogen Oxides (NOx as NO_2)	124.6	250	No
Reactive Organics	9.5	250	No
Sulfur Oxides (SOx as SO_2)	13.6	250	No
Particulate Matter	12.1	250	No

Off-Site Mobile Exhaust Emissions	
Pollutant	**Prop**
Carbon Monoxide	79.5
Nitrogen Oxides (NOx as NO_2)	176.0
Reactive Organics[3]	20.7
Sulfur Oxides[4] (SOx as SO_2)	5.3
Particulate Matter[4,5]	27.9

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

In addition to respiratory problems, dust from physical site disturbance, material deliveries, employee commuting and from wind erosion during high wind episodes may create a visual and soiling nuisance beyond the right-of-way for the access corridor and property line. As the nearest downwind sensitive receptors are located at a distance of about 40 miles, dust settlement would not result in a significant adverse air quality impact to these receptors.

Miscellaneous Emissions

Other sources of emissions which would also be present during the construction of the HVR facility include paving with asphalt and the storage and dispensing of diesel fuel.

Including the access corridor, the project would pave approximately 34 to 46 acres (depending upon the chosen roadway alignment) with asphaltic concrete. AP-42, Section 4.5 lists three types of asphalt typically used in road construction. These include cutback asphalt, emulsified asphalt and asphalt cement. Of these, the only type which is recognized as producing significant quantities of volatile organic compounds (VOC) emissions is the cutback asphalt. Emission factors for the other types are so low as not to be presented in AP-42 and are considered insignificant. HVR proposes the use of asphaltic concrete. Thus, paving is not expected to contribute to the deterioration of the local air quality and no significant adverse impacts are anticipated.

The storage of diesel for construction equipment is not expected to add substantially to the air emissions. AP-42 lists transfer operations for diesel loading from tank trucks as 0.03 pounds per 1,000 gallons transferred. As previously calculated, the project construction is expected to consume approximately 960 gallons of diesel daily with a calculated fueling loss of 0.03 pounds per day. Due to the low Reid vapor pressure of diesel, evaporative losses from on-site diesel storage are even lower. These values are considered insignificant and would not adversely affect the local air quality.

Phase 4

Exhaust Emissions

Phase 4 would involve the construction of the facilities area with simultaneous repository excavation. The construction of the facility is considered civil construction whereas the excavation is similar to an open pit mine. This phase would utilize seven pieces of heavy equipment for as period anticipated at approximately 3.5 calendar months.

Construction equipment would create exhaust pollutants from on-site earth movement and from equipment bringing concrete, asphalt and other building materials on-site. Excavation and construction activities would consume diesel fuel and thus produce combustion by-products. The equipment to be used during construction includes one bull dozer, five scrapers and one grader. Daily fuel usage is calculated at 672 gallons per day.

Exhaust emissions would also be generated by workers and materials haul trucks commuting to the site. These are anticipated to emanate from the Barstow area. Table 4.5-2 gives the calculated on-site exhaust emissions for heavy equipment and off-site mobile emissions for materials deliveries and worker commutes for project development. Calculations are presented in Appendix E2.

As shown in Table 4.5-2, the construction of the facilities with simultaneous excavation will not exceed the impact criteria and no significant impacts are anticipated.

Fugitive Dust

Site clearing, building construction, repository excavation and equipment travel on unpaved surfaces would generate considerable quantities of fugitive dust during project development. Additionally, the building structures would be manufactured on-site using an electric portable 50 ton per hour concrete batch plant. For dust, construction in the facilities area is based upon 1.2 tons of dust per acre per month of activity (AP-42, 1988, Section 11.2.4), while repository excavation is based on emission factors applicable to the removal of overbearing soil at western surface coal mining operations (AP-42, 1988, Section 8.24.1). The combined PM-10 emissions, including the batch plant and exhaust emissions (assuming twice daily watering) are calculated at 199.9 pounds on a daily basis. Therefore, no significant adverse impact is anticipated.

Miscellaneous Emissions

Other sources of emissions would also be present during the construction of the HVR facility including the storage and dispensing of diesel and evaporative emissions from cleaners, paints, solvents and other materials used in building construction.

The storage of diesel for construction equipment is not expected to add substantially to the air emissions. Based upon a fuel consumption of 672 gallons of diesel daily the calculated fueling loss is of 0.02 pounds per day with evaporative losses being even less. These values are considered insignificant and will not adversely affect the local air quality.

The use of solvents in the cleaning and painting of the structures would generate only a modest quantity of VOC emissions. Solvents typically volatilize by 100 percent while coatings, such as paint, lose approximately 40 to 60 percent of their volume due to volatilization. The use of these solvents and paints would be very low in project construction and most structures, being constructed of concrete, are to be left uncoated. Thus, no significant adverse impacts due to the application of solvents and paints are expected.

Table 4.5-2

PROJECT CONSTRUCTION AIR POLLUTION EMISSIONS FOR HEAVY EQUIPMENT AND WORKER COMMUTING INVOLVED IN THE CONSTRUCTION OF THE HVR FACILITY WITH REPOSITORY EXCAVATION (PHASE 4)

Pollutant	Daily Emissions (lb/day[1])	SBCAPCD Threshold Level (lb/day)	Exceeds Threshold?
On-Site Exhaust Emissions			
Carbon Monoxide	54.1	750	No
Nitrogen Oxides (NOx as NO_2)	169.3	250	No
Reactive Organics	12.6	250	No
Sulfur Oxides (SOx as SO_2)	20.3	250	No
Particulate Matter	17.6	250	No
Off-Site Mobile Exhaust Emissions			
Pollutant	**Daily Emissions (lb/day)[1]**		
Carbon Monoxide	74.1		
Nitrogen Oxides (NOx as NO_2)	84.7		
Reactive Organics[2]	13.8		
Sulfur Oxides[3] (SOx as SO_2)	2.6		
Particulate Matter[3,4]	13.5		

1 Based upon 1995 composite vehicle emission factors and assumes an average temperature of 75°F and an average speed of 55 mph. Mobile vehicle emissions factors for carbon monoxide, nitrogen oxides and reactive organics as modeled using EMFAC7PC. All construction equipment emission factors as calculated using AP-42, 1985.

2 Based upon 90 percent of total organics for vehicle travel.

3 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.

4 Includes exhaust, tire wear and brake wear PM-10 particulate matter.

Phase 5

Exhaust Emissions

Phase 5 involves the construction of the containment area with simultaneous repository excavelf. By the time such emissions reach any sensitive receptor sites away from the project site, they would be diluted to well below any level of air quality concern. An occasional "whiff" of diesel exhaust from trucks accessing the site from public roadways could result. Such brief exhaust odors are an adverse, but not significant, air quality impact.

Grading and construction activities would consume diesel fuel and thus produce combustion by-products. The equipment to be used during construction would include two bull dozers, two scrapers, four graders and two rollers. These pieces are typically moved on-site and remain for the duration of construction. Daily fuel usage is calculated at 960 gallons per day.

Exhaust emissions would also be generated by workers commuting to the site. It is anticipated that as many as 26 workers would travel to the site from the Barstow area, a distance of about 35 miles, on a daily basis. Finally, haul trucks would be used to bring road materials to the site on a regular basis. These are also anticipated to emanate from the Barstow area. Table 4.5-3 gives the calculated on-site exhaust emissions for heavy equipment and off-site mobile emissions for materials deliveries and worker commutes for project development. Calculations are presented in Appendix E2.

As shown in Table 4.5-3, the construction of the access road and facilities area would neither exceed the SBCAPCD NSR levels nor the impact criteria for the various on-site regulated from the excavation activities (assuming twice daily watering) and the rock and the batch plants is calculated at 290.9 pounds of PM-10 dust and particulate matter on a daily basis. This value is over the 250 pound per day significance criteria and constitutes a significant adverse impact.

Miscellaneous Emissions

Other sources of emissions include the storage and dispensing of diesel fuel. As with Phases 1 through 4, this is considered insignificant.

Mitigation Measures

No exhaust emission impacts would occur during Phases 1 through 5 and no mitigation is required.

Standard mitigation measures would be implemented to control fugitive dust emissions during construction as required by SBCAPCD Rules 402 and 403. These rules contain a nuisance provision that gives an inspector wide latitude to enforce dust abatement, particularly in the event of a nuisance complaint. Due to the extreme distances of sensitive receptors, no nuisance complaints are anticipated. Still, typical abatement measures including daily watering of active

Table 4.5-3

PROJECT CONSTRUCTION AIR POLLUTION EMISSIONS FOR HEAVY EQUIPMENT AND WORKER COMMUTING INVOLVED IN THE CONSTRUCTION OF THE CONTAINMENT AREA WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 5)

Pollutant	Daily Emissions (lb/day[1])	SBCAPCD Threshold Level (lb/day)	Exceeds Threshold?
On-Site Exhaust Emissions			
Carbon Monoxide	48.5	750	No
Nitrogen Oxides (NOx as NO_2)	153.7	250	No
Reactive Organics	12.3	250	No
Sulfur Oxides (SOx as SO_2)	18.1	250	No
Particulate Matter	15.8	250	No
Off-Site Mobile Exhaust Emissions			
Pollutant	**Daily Emissions (lb/day)[1]**		
Carbon Monoxide	51.9		
Nitrogen Oxides (NOx as NO_2)	45.6		
Reactive Organics[2]	8.7		
Sulfur Oxides[3] (SOx as SO_2)	1.4		
Particulate Matter[3,4]	7.3		

1 Based upon 1995 composite vehicle emission factors and assumes an average temperature of 75°F and an average speed of 55 mph. Mobile vehicle emissions factors for carbon monoxide, nitrogen oxides and reactive organics as modeled using EMFAC7PC. All construction equipment emission factors as calculated using AP-42, 1985.

2 Based upon 90 percent of total organics for vehicle travel.

3 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.

4 Includes exhaust, tire wear and brake wear PM-10 particulate matter.

construction areas and all traveled dirt roads to minimize dust lofting from vehicular disturbance would be used. These methods, however, were considered in the dust calculations and for Phase 5 the resultant volume of dust was calculated at over 290 pounds per day. Here mitigation would be to reduce the daily level of activity and/or use additional material for control. Finally, construction operations may have to be temporarily abated during high wind conditions.

Even with the inclusion of dust suppression techniques commonly practiced during construction, dust emissions could remain significant based upon the level of activity for the heavy equipment proposed during Phase 5. Mitigation includes cutting back the level operation to 85 percent of that proposed during this phase to reduce the impact to a level of adverse, but not significant.

Even though off-site emissions are not considered to be significant by the impact criteria, they should be considered in the final design of the project.

4.5.2.2 Initial Operations

Impacts

The initial operations included in Phase 6 involve the normal operation of the facility with continuing construction of the containment area and simultaneous repository excavation. At this point the facility will begin to receive residual and clean-up wastes at a rate of 45 trucks or 900 cubic yards per day. This phase would utilize six pieces of heavy equipment.

Exhaust Emissions

Off-site Emissions

The greatest portion of the off-site exhaust would be generated from the haul trucks which are estimated at 170 miles in each direction. These trucks, though proceeding to the project site for waste disposal, would seek other facilities in which to dispose of their loads if the project were not constructed. Some of these facilities are located at considerably longer distances (e.g., Beatty, Nevada) while others are located at similar distances (e.g., Laidlaw near Buttonwillow, California). Thus, even without project implementation, similar, if not greater level, of vehicle pollutants would be produced. These emissions being produced off-site are not subject to NSR and are not considered in the impact criteria. Further, because almost all of the project-related air quality emissions derive from haul-truck travel and are beyond the control of the developer or local regulatory agencies, there is little potential for substantial impact mitigation. To reduce overall exhaust emissions, the Applicant proposes a shuttle bus from the Hector area alleviating 960 miles per day of automobile travel with its associated emissions. This would reduce employee vehicles to 10 automobiles and one bus.

For the first two years of operation about 45 trucks per day would deliver waste residuals to the facility. Twelve additional trucks per day would be are anticipated for silo construction and miscellaneous materials and water deliveries. Including employee commutes, the total ADT is

230. Exhaust emissions would be generated by workers and materials delivery trucks commuting to the site. These are anticipated to emanate from the Barstow area. Table 4.5-4 gives the calculated off-site exhaust emissions for residual hauls, materials deliveries and worker commutes for the project. Calculations are presented in Appendix E2.

On-site Emissions

On-site construction is anticipated to require six pieces of heavy equipment and a water truck. Heavy equipment daily fuel usage is calculated at 672 gallons per day. Exhaust emissions factors are based upon the individual types of equipment and include one bull dozer, three scrapers, one grader and one loader. The Applicant proposes to use a conveyor system, on-site rail system, and/or on-site haul trucks to move the residuals from the facilities area to the repository area. A worst case scenario would be that all wastes would be transported from the facility to the repository by truck. Thus, exhaust and dust emissions are based upon this scenario. Actual on-site emissions would be less then those presented if these other conveyances are put to use. As shown in Table 4.5-4, on-site exhaust emissions would not exceed our impact criteria and no significant impacts are anticipated.

Fugitive Dust

On-site Emissions

Dust from materials handling, as well as from soil removal, soil transfer, soil drops, erosion, and rock and batch plant operation is presented below.

Dust would also be generated as a result of on-site heavy equipment operation and, in lieu of a conveyor or train, truck travel over both paved and gravel roads. After reaching the main facility, trucks would be screened for proper waste characterization. Wastes would then be transferred to the silo area by trucks or a covered conveyor system. Based upon data generated from sand and gravel operations, batch drops from truck unloading generate 0.0024 pounds of PM-10 emissions per ton unloaded. This equates to approximately 2 pounds of fugitive emissions daily. This operation would actually be conducted within an enclosed structure controlled by an air filtration system and thus produce negligible emissions.

From this point a conveyor system would be used to convey the material to the storage silos. AP-42, Section 8.19.2 assigns a value of 0.0002 pounds of PM-10 particulate matter per ton of material conveyed as a best estimate of covered conveyor emissions. Based upon the movement of 900 tons of material a day, conveyor losses are calculated at 0.2 pounds per day.

As an alternative to the conveyor system, on-site, bottom-dump haul trucks may be used. This would present a worst case scenario. Dust would be generated along the interior access road which extends from the receiving building to the repository site, a distance of about 1,500 feet. Approximately half of this travel would be over paved road while the other half over maintained gravel roads. The number of trucks would be equal to the number of trucks bringing wastes to

Table 4.5-4

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL OPERATIONS OF THE HVR FACILITY WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 6)

Pollutant	Daily Emissions (lb/day[1])	SBCAPCD Threshold Level (lb/day)	Exceeds Threshold?
On-Site Exhaust Emissions			
Carbon Monoxide	38.9	750	No
Nitrogen Oxides (NOx as NO_2)	124.1	250	No
Reactive Organics	10.2	250	No
Sulfur Oxides (SOx as SO_2)	14.4	250	No
Particulate Matter	12.7	250	No
Off-Site Mobile Exhaust Emissions			
Pollutant	**Daily Emissions (lb/day)[1]**		
Carbon Monoxide	256.4		
Nitrogen Oxides (NOx as NO_2)	666.2		
Reactive Organics[2]	73.6		
Sulfur Oxides[3] (SOx as SO_2)	19.9		
Particulate Matter[3,4]	105.5		

1 Based upon 1995 composite vehicle emission factors and assumes an average temperature of 75°F and an average speed of 55 mph. Mobile vehicle emissions factors for carbon monoxide, nitrogen oxides and reactive organics as modeled using EMFAC7PC. All construction equipment emission factors as calculated using AP-42, 1985.

2 Based upon 90 percent of total organics for vehicle travel.

3 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.

4 Includes exhaust, tire wear and brake wear PM-10 particulate matter.

the facility (i.e., 45). As mentioned, these trucks would transport the sorted materials a distance of approximately 1,500 feet. A return trip brings this trip up to 3,000 feet for a total of about 26 miles for the 45 loads. The dust emissions are calculated as 0.8 pounds per day over the paved area and 11.3 pounds per day over the gravel for a total of 12.1 pounds of PM-10 for on-site trucks.

Another possible source of fugitive dust generation has to do with the operation of placing the residual material into the silos. The expected fugitive emissions are approximately 2 pounds per day. The PM-10 value would depend upon the content of fines in the material which would vary with the origin of the load. In actuality, expected losses are less as the opening to the silos (and potential to lose fugitive dust) are considerably smaller than the gratings used in the dumping from sand and gravel trucks and as the silos are deeper than the sand and gravel drop, more dust would settle out before reaching the opening and becoming airborne. Further, these emissions would be controlled using temporary dust covers. These emissions are therefore considered negligible.

AP-42, Section 8.24 gives emission factors for uncontrolled fugitive losses for open pit mining as well as loading and unloading of raw and aggregate materials. Using water control, losses for topsoil removal utilizing scrapers are calculated at 50.7 pounds of PM-10 per day for the anticipated 96 loads. Additionally, a bull dozer and a loader would be utilized. Based upon the methodology presented in AP-42, Section 8.24, PM-10 dust emissions due to bull dozer operations utilizing water control are 17.6 pounds per day. Loader emission are expected to be similar for an additional 17.6 pounds per day. Additionally, a grader is proposed. Grader emissions are as calculated in AP-42 and are 4.4 pounds of PM-10 dust per mile traveled. Assuming that the grader averages 3 miles per hour and watering can attain a control efficiency of 50 percent, 52.8 pounds of PM-10 per day would be produced. Finally, the water truck would produce dust emissions as it drives over the various dirt, gravel and paved surfaces. These emissions are calculated at 1.7 pounds of PM-10 dust per day. Thus, soil removal is expected to generate 140.4 pounds of PM-10 dust per day.

Soil removed from the excavation area would either be moved to the surrounding berm or taken to the rock plant by scraper. Assuming a 50 percent control efficiency for watering, scraper travel will generate 24.3 pounds of PM-10 dust per day.

The 96 loads of soil moved by the scrapers would either be deposited in the bermed area or at the rock plant. Based upon an calculations in accordance with AP-42, soil unloaded from the scrapers will generate 35.0 pounds of PM-10 dust per day.

Dust would also be generated as a result of wind action on the excavation and active stockpiles for the rock and batch plants. These emissions would total 6.3 pounds of PM-10 dust per day.

Based upon a throughput of 500 tons per day to produce an output of 400 tons per day for the batch plant (assuming 25 percent for overage), for a controlled facility crushing, screening and loading operations are anticipated to generate approximately 12.2 pounds of PM-10 dust per day.

Material loaded for backhaul will generate an additional 4.2 pounds of PM-10 dust per day.

Based upon a throughput of 400 tons per day and an average control efficiency of 0.02 pounds of PM-10 per cubic yard processed (as per AP-42), the batch plant is expected to generate 5.9 pounds of PM-10 per day.

Total dust produced on-site is that from the combined operations and on-site vehicle travel. (Note that these emissions do not include the transfer of residuals within the enclosed facility area, nor do they include the placement of wastes into the silos and trapezoids which are to be controlled using dust hoods and are both insignificant.) A recap shows:

Heavy equipment operations (includes water truck)	199.7 lb/day
On-site Exhaust (includes heavy equipment, on-site water truck usage and on-site residuals hauls)	12.7 lb/day
Internal on-site travel for hauls trucks	12.1 lb/day
Wind erosion for excavation and stockpiles	5.9 lb/day
Rock plant	12.2 lb/day
Truck loading for backhaul	4.2 lb/day
Batch plant	5.9 lb/day
Total	253.1 lb/day

Thus, the expected daily PM-10 emissions are 253.1 pounds per day. This value, being above the 250 pounds per day significance criteria, would constitute a significant adverse impact. However, this represents a worst case scenario in that transfer operations from the receiving facility to the repository area are calculated based on truck emissions for both dust and exhaust particulate matter. The proposed project would probably use a conveyor system in lieu of these trucks and this would reduce emissions by 11.9 pounds per day for a net PM-10 dust loading of 241.2 pounds per day. Further, equipment operations are based upon an 8-hour working day with all heavy equipment operation for the full 8 hours. In actuality, the workers take regular breaks and the equipment sits at idle. During these periods, though exhaust emissions may be produced, dust emissions are not. Thus, the PM-10 particulate matter would probably not result in a significant impact.

Miscellaneous Emissions

Other sources of emissions would also anticipated as a result of facility operations. These include:

- Volatile organic emissions associated with the wastes brought to the site.
- Volatile organic emissions associated with the transfer of wastes brought to the site.
- Volatile organic emissions associated with the storage and transfer of diesel for on-site heavy equipment.
- Volatile organic emissions associated with the wash-down of trucks and railcars after removal of their loads.
- Volatile organic emissions associated with the evaporation ponds from materials washed-down from the site.
- Hydrogen sulfide and metals' fumes associated with any on-site welding operations.

With the exception of diesel fueling and welding, most volatile emissions would depend upon the types and quantities of residuals materials accepted by the facility. As these residuals would be stabilized wastes, these emissions are unquantifiable but are considered relatively minor. As per DOT standards, trucks carrying residuals material would either be enclosed or covered with tarpaulins prior to leaving their pick-up points. Further, all residuals would be transferred in a waste unloading facility. This facility would be fully enclosed and utilize double entry air locks at entry and exit points for truck and, in later operations, rail traffic. Dust control hoods and covers would be installed at all generation points and would discharge to an air cleaning system. Discharge air would be cleaned by cyclones and baghouse equipment and collected dust placed in repository containment. Thus, no significant adverse impacts are anticipated from these operations.

As for fuel losses, based upon the consumption of 12 gallons per hour of diesel for an average piece of heavy equipment and six pieces on-site in use on a daily basis, approximately 576 gallons of diesel would be used each day. Fueling losses are calculated at 0.02 pounds per day. Due to the low Reid vapor pressure of diesel, evaporative losses from on-site diesel storage are even lower. Thus, the storage and fueling of diesel for heavy equipment is not expected to add substantially to the air emissions. These values are considered insignificant and would not adversely affect the local air quality. Welding emissions would vary with the amount of necessary on-site repairs and fabrication, but are also considered insignificant.

Secondary Impacts

Other air quality impacts would occur indirectly as a result of project implementation. These indirect impacts are individually small, but can make a substantial contribution to regional air quality when summed for the County overall. These secondary impacts include:

- Increased fossil fuel combustion in County power plants to provide electrical energy to the project area.

- Increased evaporative emissions from the transport, storage and dispensing of petroleum-based fuel for project-related waste-hauling and employee operated vehicles.

- Dust emissions from the manufacture of any building materials not directly manufactured on-site.

These impacts are considered adverse, but would not be produced in quantities which are significant.

Mitigation Measures

Dust from physical on-site disturbance and from wind erosion during high wind episodes may create a visual and soiling nuisance beyond the right-of-way for the access corridor and property line. Using a worst case scenario the calculated volume of PM-10 dust emitted on-site on a daily basis is 258.8 pound per day. Based upon the project design, this value would be approximately 247 pounds per day, and would not exceed impact criteria. As with construction, standard mitigation measures will be implemented to control fugitive dust emissions during operations as required by SBCAPCD Rules 402 and 403. Due to the extreme distances of sensitive receptors, no nuisance complaints are anticipated. Still, typical abatement measures including regular watering of active areas and all traveled paved and gravel roads to minimize dust lofting from vehicular disturbance will be used. Additionally, due to the lack of water at the site, a lignin based dust suppressant will be used at the site of the repository excavation on all inactive areas. Finally, operations may have to be temporarily abated during high wind conditions. Finally, a slight cut-back in the level of activity for heavy equipment or the alleviating of any one piece of heavy equipment will bring the calculated amount of dust into compliance. This then would reduce a potentially significant impact to below the significance threshold.

4.5.2.3 Subsequent Construction

Impacts

Exhaust Emissions

Off-site Exhaust Emissions

The work force of 58 would be retained during this period and use of the shuttle bus would continue. An anticipated 45 trucks per day will deliver residuals to the facility. Twelve additional trucks per day would be anticipated for miscellaneous materials and water deliveries. Including employee commutes, the total ADT is 230. Exhaust emissions would be similar to those generated during initial operations are as presented in Table 4.5-5. Calculations are presented in Appendix E2.

On-site Emissions

Final buildout plans call for the installation of a railroad spur to shuttle railcars from the Hector area; a distance of about 10 miles. This would be constructed in Phase 7 after the facility has been in operation for about two to three years. During this time the facility would continue to receive as many as 45 trucks of residuals on a daily basis. To alleviate on-site emissions, excavation of the repository would be curtailed during this 2.5 month period.

Railroad construction would require five pieces of heavy equipment and a water truck. Heavy equipment daily fuel usage is calculated at 480 gallons per day. Exhaust emissions factors are based upon the individual types of equipment and include one bull dozer, one scraper, one grader and two loaders.

A conveyor system, on-site rail system, and/or on-site haul trucks would be used to move the residuals from the facilities area to the repository area. A worst case scenario would be that all wastes would be transported from the facilities area to the repository by truck. Thus, exhaust and dust emissions are based upon this scenario. Actual on-site emissions would be less than those presented if these other conveyances are put to use.

In addition to the exhaust by-products produced by heavy equipment construction, it is estimated that the actual installation of the rails would take an additional week. Rails would be brought to the site and installed via train. Table 4.5-5 includes the calculated emissions for a 2,500 horsepower engine for each day of track-laying. As the track-laying machine would probably spend most of the time at idle, the emissions presented here are probably an overestimate but will serve for the purpose of this analysis. Even so, no significant adverse impacts are associated with the placement of the rails. As shown in Table 4.5-5, on-site exhaust emissions would not exceed the impact criteria and no significant impacts are anticipated.

Fugitive Dust

Off-site Emissions

As with Section 4.5.2.2, 57 heavy trucks, 10 automobiles and one bus would be expected to travel on the access corridor. This same assemblage would then produce a similar level of PM-10 dust or about 92.9 pounds per day assuming 80 percent dust control for roadway watering. The equation and parameters used in this calculation are presented in Appendix E2.

On-site Emissions

Fugitive dust would be generated as a result of the railroad installation as well as the on-going operations. The construction of the railroad spur is anticipated to take about 2.5 months. The average width of disturbance would be 18 feet. For a 10-mile access corridor the total area of disturbance is calculated at 21.8 acres. Based upon a soil particulate loading of 1.2 tons per acre per month and assuming twice daily watering, 37.7 pounds per day of PM-10 dust would be

Table 4.5-5

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL OPERATIONS OF THE HVR FACILITY WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 7)

Pollutant	Daily Emissions (lb/day[1])	SBCAPCD Threshold Level (lb/day)	Exceeds Threshold?
On-Site Exhaust Emissions			
Carbon Monoxide	44.5	750	No
Nitrogen Oxides (NOx as NO_2)	141.3	250	No
Reactive Organics	12.0	250	No
Sulfur Oxides (SOx as SO_2)	16.2	250	No
Particulate Matter	15.8	250	No
Off-Site Mobile Exhaust Emissions			
Pollutant	**Daily Emissions (lb/day)[1]**		
Carbon Monoxide	256.4		
Nitrogen Oxides (NOx as NO_2)	666.2		
Reactive Organics[2]	73.6		
Sulfur Oxides[3] (SOx as SO_2)	19.9		
Particulate Matter[3,4]	105.5		

1 Based upon 1995 composite vehicle emission factors and assumes an average temperature of 75°F and an average speed of 55 mph. Mobile vehicle emissions factors for carbon monoxide, nitrogen oxides and reactive organics as modeled using EMFAC7PC. All construction equipment emission factors as calculated using AP-42, 1985.

2 Based upon 90 percent of total organics for vehicle travel.

3 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.

4 Includes exhaust, tire wear and brake wear PM-10 particulate matter.

generated for grading and ballast and tie installation. This value includes those pieces of equipment used in the railroad civil construction as well as the water truck. Material for ballast would be hauled from the repository berm area and would utilize scrapers for the removal and haul trucks for the transport to the working area. Thirty-two scraper loads would be expected on a daily basis. Scraper emissions are calculated at 16.7 pounds, 10.0 and 11.5 pounds of PM-10 dust per day for loading, travel and unloading, respectively. Additionally, 80 loads of aggregate would be trucked over to the area of railroad construction per day. Assuming water control, truck dust emissions due to travel over both paved and unpaved surfaces are estimated at 132.4 pounds of PM-10 dust per day. Dumps both to and from these trucks are estimated at an additional 3.8 pounds per day.

In lieu of an on-site conveyor system, 45 loads of residuals per day would be trucked from the facilities area to the repository area for an additional 12.1 pounds of PM-10 dust. Further, as in Section 4.5.2.2, dust emissions would be produced from the rock and batch plants and erosion.

Total dust produced on-site is that from the combined operations and on-site vehicle travel. (Note that these emissions do not include the transfer of residuals within the enclosed facility area, nor do they include the placement of wastes into the silos and trapezoids which are to be controlled using dust hoods and are both insignificant.) A recap shows:

Heavy equipment operations (includes water truck)	80.0 lb/day
On-site exhaust (includes heavy equipment, on-site water truck usage and on-site residuals hauls)	16.0 lb/day
Internal on-site travel for hauls trucks	144.5 lb/day
Wind erosion for excavation and stockpiles	6.3 lb/day
Truck loading and unloading	3.8 lb/day
Rock plant	12.2 lb/day
Batch plant	5.9 lb/day
Total	268.7 lb/day

Thus, the expected daily PM-10 emissions are 268.7 pounds per day. This value, being above our 250 pounds per day significance criteria. As with Section 4.5.2.2, this represents a worst case scenario, and is a short-term significant adverse construction impact.

Mitigation Measures

As with initial construction and operations, standard mitigation measures will be implemented to control fugitive dust emissions during operations as required by SBCAPCD Rules 402 and 403. Even with the implementation of these (or equally effective) measures, the level of impact is reduced but is expected to remain significant. To reduce daily emissions, the subsequent project construction schedule could be extended. It should be pointed out, however, that this last measure will not reduce overall emissions, just spread them over a longer period of time.

4.5.2.4 Subsequent Operations

Impacts

During subsequent operations (Phase 8), the railroad would be operational and the facility would receive up to 30 railcars of residuals per day. Additionally, up to 25 trucks per day would deliver residual materials for disposal. Railcars would be dropped at the Hector siding by passing trains. Therefore, no significant additional emissions for rail service would be produced. However, a dedicated Trackmobile would be used to shuttle the railcars to the site; a distance of about 10 miles in each direction. Additionally, during this Phase the train and trucks would begin backhauling aggregate to the L.A. area. Thus, the access corridor could be considered an industrial haul road with its associated dust emissions.

Exhaust Emissions

Off-site Emissions

The work force would arrive at the facility via 10 automobiles and one bus. During this phase about 25 trucks per day would deliver wastes to the facility. Twelve additional trucks per day would be anticipated for silo construction and miscellaneous materials and water deliveries. Including employee commutes, the total ADT is 230. Exhaust emissions would be generated by workers and materials haul trucks commuting to the site. These are anticipated to emanate from the Barstow area. Table 4.5-6 gives the calculated off-site exhaust emissions for residual hauls, materials deliveries and worker commutes for the project. Calculations are presented in Appendix E2.

On-site Emissions

On-site construction is anticipated to utilize the same six pieces of heavy equipment and water truck as in Phase 6, Section 4.5.1.1. Heavy equipment daily fuel usage is calculated at 576 gallons per day. Heavy equipment and water truck exhaust emissions are as presented in Section 4.5.2.2. A conveyor system, on-site rail system, and/or on-site haul trucks would be used to move the residuals from the facilities area to the repository area. A worst case scenario would be that all wastes were transported from the facility to the repository by truck. Thus,

exhaust and dust emissions are based upon this scenario. Actual on-site emissions would be less then those presented if these other conveyances are put to use. As shown in Table 4.5-6, on-site exhaust emissions would not exceed the impact criteria and no significant impacts are anticipated.

Fugitive Dust

Off-site Emissions

Off-site emissions would be produced due to dust raised from travel along the access corridor. AP-42 states that dust emissions from industrial paved roads are a major component of particulate matter in the vicinity of industrial operations. Further, the quantity of dust raised is directly proportional to the volume of traffic and the surface dust loading. Assuming that regular watering of the road can attain an 80 percent control efficiency, the anticipated PM-10 dust emissions due to travel along the access corridor are calculated at 61.6 pounds per day for 37 trucks, ten automobiles and the shuttle bus.

On-site Emissions

Dust would also be generated as a result of on-site heavy equipment operation and, in lieu of a conveyor or on-site train, truck travel over both paved and gravel roads. After reaching the main facility, trucks would be screened for proper waste characterization. Wastes would then be transferred to the repository area by trucks or a covered conveyor system. Based upon data generated from sand and gravel operations, batch drops from truck unloading generate 0.0024 pounds of PM-10 emissions per ton unloaded. This equates to approximately 4 pounds of fugitive emissions daily. This operation would actually be conducted within an enclosed structure controlled by an air filtration system and thus produce negligible emissions.

From this point a conveyor system would be used to convey the material to the storage silos. AP-42, Section 8.19.2 assigns a value of 0.0002 pounds of PM-10 particulate matter per ton of material conveyed as a best estimate of covered conveyor emissions. Based upon the movement of 1,800 tons of material a day, conveyor losses are calculated at 0.4 pounds per day.

As an alternative to the conveyor system, on-site, bottom-dump haul trucks may be used. This would present a worst case scenario. Dust would be generated along the interior access road which extends from the receiving building to the repository site, a distance of about 1,500 feet. Approximately half of this travel would be over paved road while the other half over maintained gravel roads. The number of on-way truck trips would be equal to the permitted acceptance divided by 20 tons per truck. Thus, 90 truck trips are anticipated. These trucks would transport the sorted materials a distance of approximately 1,500 feet. A return trip brings this trip up to 3,000 feet for a total of about 51 miles for the 90 loads. The dust emissions are calculated as 1.7 pounds per day over the paved area and 22.5 pounds per day over the gravel for a total of 24.2 pounds of PM-10 for on-site trucks.

Table 4.5-6

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE SUBSEQUENT OPERATIONS OF THE HVR FACILITY WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 8)

Pollutant	Daily Emissions (lb/day[1])	SBCAPCD Threshold Level (lb/day)	Exceeds Threshold?
On-Site Exhaust Emissions			
Carbon Monoxide	44.8	750	No
Nitrogen Oxides (NOx as NO_2)	142.4	250	No
Reactive Organics	12.1	250	No
Sulfur Oxides (SOx as SO_2)	16.2	250	No
Particulate Matter	16.0	250	No
Off-Site Mobile Exhaust Emissions			
Pollutant	**Daily Emissions (lb/day)[1]**		
Carbon Monoxide	166.6		
Nitrogen Oxides (NOx as NO_2)	389.7		
Reactive Organics[2]	44.7		
Sulfur Oxides[3] (SOx as SO_2)	11.6		
Particulate Matter[3,4]	61.8		

1 Based upon 1995 composite vehicle emission factors and assumes an average temperature of 75°F and an average speed of 55 mph. Mobile vehicle emissions factors for carbon monoxide, nitrogen oxides and reactive organics as modeled using EMFAC7PC. All construction equipment emission factors as calculated using AP-42, 1985.
2 Based upon 90 percent of total organics for vehicle travel.
3 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
4 Includes exhaust, tire wear and brake wear PM-10 particulate matter.

Another possible source of fugitive dust generation has to do with the operation of placing the residual material into the silos. The expected fugitive emissions are approximately 4 pounds per day. The PM-10 value would depend upon the content of fines in the material which would vary with the origin of the load. These emissions would be controlled using temporary dust covers and are therefore considered negligible.

Emissions for soil removal, are as presented in Section 4.5.2.2 and are estimated at 50.7 pounds of PM-10 dust per day.

Soil removed from the excavation area would either be moved to the surrounding berm or taken to the rock plant by scraper. As with Section 4.5.2.2, scraper travel would generate 24.3 pounds of PM-10 dust per day.

The 96 loads of soil moved by the scrapers would either be deposited in the bermed area or at the rock plant. Drops would be expected to generate 35 pounds of PM-10 dust per day.

Dust would also be generated as a result of wind action on the excavation and active stockpiles for the rock and batch plants. These emissions total 6.5 pounds of PM-10 dust per day.

The rock plant would process approximately 500 tons per day to produce an output of 400 tons per day for the batch plant (assuming 25 percent for overage). Additionally, approximately 2,700 tons per day would be screened for export or backfill (Personal communication with Allen Henderson, HVR). For a controlled facility crushing, screening and loading operations are anticipated to generate approximately 58.9 pounds of PM-10 dust per day.

Based upon a throughput of 400 tons per day and an average control efficiency of 0.02 pounds of PM-10 per cubic yard processed (as per AP-42), the batch plant is expected to generate 5.9 pounds of PM-10 per day.

Total dust produced on-site is that from the combined operations and on-site vehicle travel. (Note that these emissions do not include the transfer of residuals within the enclosed facility area, nor do they include the placement of wastes into the silos and trapezoids which are to be controlled using dust hoods and are both insignificant.) A recap shows:

▸ Heavy equipment operations (includes water truck)	199.7 lb/day
▸ On-site Exhaust (includes heavy equipment, on-site water truck usage and on-site residuals hauls)	15.6 lb/day
▸ Trackmobile exhaust	2.8 lb/day
▸ Internal on-site travel for hauls trucks	24.2 lb/day
▸ Wind erosion for excavation and stockpiles	6.5 lb/day
▸ Rock plant (includes truck and train loading)	58.9 lb/day
▸ Batch plant	5.9 lb/day
Total	**313.6 lb/day**

Thus, the expected daily PM-10 emissions are 313.6 pounds per day. This value, being above the 250 pounds per day significance criteria, would constitute a significant adverse impact. However, this again represents a worst case scenario in that transfer operations from the receiving facility to the repository area are calculated based on truck emissions for both dust and exhaust particulate matter. The proposed project has as an option the use of a conveyor system in lieu of these trucks, which would reduce PM-10 emissions by 23.8 pounds per day. Further, equipment operations are based upon an 8-hour working day with all heavy equipment operation for the full 8 hours. In actuality, the workers take regular breaks and the equipment sits at idle. During these periods, though exhaust emissions may be produced, dust emissions are not. Thus, the PM-10 particulate matter may not exceed the impact criteria.

Miscellaneous Emissions

Other sources of emissions are also anticipated as a result of facility operations. These are as presented in Section 4.5.2.2.

Secondary Impacts

Other air quality impacts would occur indirectly as a result of project implementation. These are as presented in Section 4.5.2.2.

Mitigation Measures

Off-site emissions due to dust raised from travel along the access corridor are estimated at 61.6 pounds per day assuming that regular watering of road can attain an 80 percent control reduction. In actuality, the access corridor is proposed for non-exclusive use by the Applicant and is therefore not subject to NSR review or the significance criteria. Still, to reduce local emissions, the Applicant has provided for a shuttle bus which will alleviate approximately 6 pounds of PM-10 dust (as well as reducing exhaust emissions). Additionally, the Applicant has consented to keep this corridor clean using water control.

Dust from physical on-site disturbance and from wind erosion during high wind episodes may create a visual and soiling nuisance beyond the property line. Using a worst case scenario the calculated volume of PM-10 dust emitted on-site on a daily basis is 313.6 pounds per day. Standard mitigation measures will be implemented to control fugitive dust emissions during operations as required by SBCAPCD Rules 402 and 403. Due to the extreme distances of sensitive receptors, no nuisance complaints are anticipated. Still, typical abatement measures including regular watering of active areas and all traveled paved and gravel roads to minimize dust lofting from vehicular disturbance will be used. Additionally, due to the lack of water at the site, a lignin based dust suppressant will be used at the site of the repository excavation on all inactive areas. Operations may also have to be temporarily abated during high wind conditions. Finally, a cut-back in the level of heavy equipment operations would bring the

calculated amount of dust into compliance. This then would reduce a significant impact to a level of insignificance.

4.5.3 Reduced Facility Size Alternative

Under this alternative a facility of similar or reduced size and design would be constructed and types of operations would be unchanged. The only operational changes affecting air quality would be in the volume of waste materials accepted and the amount of aggregate produced for export. As with the proposed project, initial construction would occur in two phases. Impacts and mitigations are as presented in Section 4.5.2.1.

4.5.3.1 Initial Operations

Impacts

Exhaust Emissions

Upon project completion, a reduced work force would be used to staff the facility. For the first two years of operation about 23 trucks per day would deliver wastes to the facility. An additional two trucks per day are anticipated for silo construction and miscellaneous materials. Including employee commutes, the total average daily traffic volume (ADT) would be 120.

Table 4.5-7 presents the pollutant loading for project generated travel as based upon the EMFAC7PC Model distributed by the California Air Resources Board and emission factors for heavy equipment as presented in AP-42. On-site emission sources include the use of three pieces of heavy equipment for repository excavation and one water truck for dust control. Additionally, as a worst case scenario it was assumed that 23 on-site trucks would be used to convey the materials to the repository sites. As shown in Table 4.5-7, exhaust emissions due to on-site operations do not exceed the impact criteria and no adverse impacts are anticipated.

Fugitive Dust

Assuming an 80 percent control efficiency for regular watering, off-site vehicle travel would generate approximately 48.0 pounds of PM-10 dust along the access corridor.

On-site operations which generate dust are as discussed for the proposed action, including a visual and soiling nuisance, with the only difference being in the volume of residuals and wastes processed. Based on a throughput of 50 percent of the proposed project, and assuming the same buildout schedule for the rail spur, on-site PM-10 emissions would be roughly half (or approximately 126.6 pounds per day) of those calculated for the proposed action. Based upon the impact criteria, this value would not be considered a significant adverse impact.

Table 4.5-7

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL OPERATIONS OF THE REDUCED HVR FACILITY ALTERNATIVE WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 6)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	19.5	38.9	750	No
Nitrogen Oxides (NOx as NO_2)	62.0	124.1	250	No
Reactive Organics	5.2	10.2	250	No
Sulfur Oxides (SOx as SO_2)	7.2	14.4	250	No
Particulate Matter	6.4	12.7	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	141.4	256.4
Nitrogen Oxides (NOx as NO_2)	355.5	666.2
Reactive Organics[3]	39.6	73.6
Sulfur Oxides[4] (SOx as SO_2)	10.6	19.9
Particulate Matter[4,5]	56.3	105.5

1 **Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.**
2 **Alter/Prop - Alternative project/proposed project.**
3 **Based upon 90 percent of total organics for vehicle travel.**
4 **Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.**
5 **Includes exhaust, tire wear and brake wear PM-10 particular matter.**

Miscellaneous Emissions

Emissions from miscellaneous sources are as discussed in Section 4.5.2.1 for the proposed action. Based upon a throughput of 50 percent of the proposed action, these losses would be on the order of 50 percent. As these losses were not significant for the proposed project, an approximate 50 percent reduction would not produce any significant adverse impacts.

Secondary Impacts

Emissions from secondary impacts are as described in Section 4.5.2.2 for the proposed action. These also would be reduced by approximately 50 percent and no significant adverse impacts are anticipated.

Mitigation Measures

No significant adverse impacts have been identified and no mitigation is necessary.

4.5.3.2 Subsequent Construction

Impacts

Exhaust Emissions

Final buildout plans would include the construction of the railroad spur after the facility has been in operation for two to three years. As no significant adverse impacts were associated with the proposed action, none are expected for this alternative. Table 4.5-8 presents both the on- and off-site exhaust emission associated with this phase of this reduced facility alternative.

Fugitive Dust

Off-site PM-10 emissions due to vehicle travel along the access corridor are as presented in Section 4.5.3.1 above, for initial operations and are 48.0 pounds per day. For on-site emissions, if construction of the spur be accomplished in approximately the same time frame as with the proposed action, PM-10 emissions, predicted at 189.8 pounds per day, would not exceed the impact criteria and no significant adverse impact is anticipated.

Mitigation Measures

No significant impact is anticipated and no mitigation is necessary.

Table 4.5-8

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL OPERATIONS OF THE REDUCED HVR FACILITY ALTERNATIVE WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 7)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	44.6	44.5	750	No
Nitrogen Oxides (NOx as NO_2)	141.9	141.3	250	No
Reactive Organics	12.0	12.0	250	No
Sulfur Oxides (SOx as SO_2)	16.2	16.2	250	No
Particulate Matter	15.9	15.8	250	No

Pollutant	Daily Emissions[1] (lb/day)	
	Alter	Prop
Off-Site Mobile Exhaust Emissions		
Carbon Monoxide	141.4	256.4
Nitrogen Oxides (NOx as NO_2)	355.5	666.2
Reactive Organics[3]	39.6	73.6
Sulfur Oxides[4] (SOx as SO_2)	10.6	19.9
Particulate Matter[4,5]	56.3	105.5

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

4.5.3.3 Subsequent Operations

Impacts

Exhaust Emissions

As no significant adverse impacts are associated with the proposed action, a reduced operation with half the amount of materials processed would not produce any significant adverse impacts either. Exhaust emissions are as presented in Table 4.5.9.

Fugitive Dust

As with the proposed action, dust would be generated along the various access routes and from the various on-site processes. These emission sources are as presented in Section 4.5.2.4. For traffic along the access corridor, dust emissions are calculated at 30.5 pounds per day.

For on-site emissions, the reduced facility would operate at a throughput of half of the proposed facility, and almost all dust emissions are directly related to project throughput, dust emissions are expected to be reduced by approximately 50 percent. Thus, the total PM-10 dust loading (including vehicle travel) is expected to be reduced from approximately 313.6 to 156.8 pounds per day. This value is then insignificant.

Secondary Impacts

Secondary impacts are as presented in Section 4.5.2.2 for the proposed action and are considered insignificant.

Mitigation Measures

No significant adverse impacts have been identified and no mitigation measures are necessary.

4.5.4 Transport by Trucks Only Without Rail Spur Alternative

Under this alternative the facility would be constructed as in the proposed project alternative (Phases 1 through 5). Initial operations (Phase 6) would be as projected for the proposed action. Phase 7 would be eliminated as the railroad spur would not be constructed. Finally, in Phase 8 the volume of haul trucks would rise from 25 to 80 (plus about 12 trucks per day for miscellaneous deliveries) during the subsequent operations. Thus, initial construction and operational emissions impacts and mitigations (Phases 1 through 6) would be those as presented for the proposed project. Changes would result during subsequent construction and operation.

Table 4.5-9

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE SUBSEQUENT OPERATION OF THE REDUCED FACILITY ALTERNATIVE WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 7)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	22.4	44.8	750	No
Nitrogen Oxides (NOx as NO_2)	71.2	142.4	250	No
Reactive Organics	6.5	12.7	250	No
Sulfur Oxides (SOx as SO_2)	8.1	16.2	250	No
Particulate Matter	8.0	16.0	250	No

Pollutant	Daily Emissions[1] (lb/day)	
	Alter	Prop
Off-Site Mobile Exhaust Emissions		
Carbon Monoxide	87.6	166.6
Nitrogen Oxides (NOx as NO_2)	189.6	389.7
Reactive Organics[3]	22.3	44.7
Sulfur Oxides[4] (SOx as SO_2)	5.7	11.6
Particulate Matter[4,5]	30.0	61.8

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

4.5.4.1 Subsequent Construction

Under this alternative no rail spur would be constructed and its accompanying emissions would be alleviated. Thus, no additional impacts over those described for the proposed action, initial operations would be incurred during this period and no additional mitigation would be necessary.

4.5.4.2 Subsequent Operations

Impacts

Exhaust Emissions

Under this scenario the facility would receive about 80 waste haul trucks per day. Additionally, 12 trucks are anticipated for miscellaneous deliveries. On-site operations would be similar or slightly reduced (as 80 trucks would bring in 1,600 tons rather than the 1,800 tons for the proposed action) from those for the proposed project with all on-site emissions and impacts remaining similar.

Off-site emissions would be almost tripled due to the use of 92 haul trucks as opposed to 37. Table 4.5-10 lists the exhaust emissions for all site operations including haul trucks and employee commutes. Modeled assumptions are as presented in Appendix E2.

Fugitive Dust

Under this alternative, dust generated on-site by the facility would be expected to remain the same as for the proposed action.

Additional dust would be generated along the access corridor due to the greater volume of haul trucks traveling along this stretch. For this alternative the volume of trucks on the access road would rise from 74 to approximately 184 ADT with a corresponding increase in dust emissions. These additional emissions are calculated at approximately 87 pounds per day for a total of PM-10 dust loading of 145.7 pounds per day due to heavy truck travel on the access road. Including employee travel, total PM-10 dust generation along the access road is then calculated as 148.3 pounds whereas this value was calculated as 61.6 pounds for the project as proposed. Still, these are off-site mobile emissions and are not subject to NSR review or the significance criteria.

Table 4.5-10

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE SUBSEQUENT OPERATION OF THE TRANSPORT BY TRUCK ONLY ALTERNATIVE WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 8)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	44.8	44.8	750	No
Nitrogen Oxides (NOx as NO_2)	142.4	142.4	250	No
Reactive Organics	12.1	12.7	250	No
Sulfur Oxides (SOx as SO_2)	16.2	16.2	250	No
Particulate Matter	16.0	16.0	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	413.4	166.6
Nitrogen Oxides (NOx as NO_2)	1,150.0	389.7
Reactive Organics[3]	124.1	44.7
Sulfur Oxides[4] (SOx as SO_2)	34.3	11.6
Particulate Matter[4,5]	182.0	61.8

1 **Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.**
2 **Alter/Prop - Alternative project/proposed project.**
3 **Based upon 90 percent of total organics for vehicle travel.**
4 **Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.**
5 **Includes exhaust, tire wear and brake wear PM-10 particular matter.**

Mitigation Measures

Proposed mitigation measures under this alternative are as those described for the proposed project in Section 4.5.2.4 of the proposed action. Residual impacts are as also as presented in that section.

4.5.5 Rail Container Transfer Facility

Under this alternative a railcar transfer facility would be constructed at the Hector siding (or in proximity thereto). Intermodal containers would be off-loaded at this location, loaded onto haul trucks and delivered to the site via the access road. This alternative would alleviate the construction of the rail spur in Phase 7, but would necessitate the construction of the unloading/reloading facility at the Hector siding.

Initial construction and operations and associated impacts would be identical to that presented for the proposed action. Changes would result during subsequent construction and operations as described below.

4.5.5.1 Subsequent Construction

Impacts

Subsequent construction and its associated impacts would be identical to those presented for the proposed action, as presented in Section 4.5.2.3, except that the railroad spur would not be constructed. This would alleviate both the dust and exhaust emissions associated with the construction of the spur. However, construction of the transfer facility would also produce emissions. These are addressed below.

Exhaust Emissions

Exhaust emissions produced by vehicles traveling along the access corridor are as presented for the proposed action in Section 4.5.2.3.

If it is assumed that the transfer facility would disturb about 4 acres and take 3 weeks for construction involving the same number of construction workers and pieces of construction equipment, daily exhaust emissions would be similar to those produced in the construction of the facility and presented in Section 4.5.2.1, Phase 4, but the time frame would be shortened from 2.5 months to 3 weeks with a corresponding decrease in the overall amount of emissions produced. All other exhaust emissions remain as with the proposed action as presented in Section 4.5.2.3.

Fugitive Dust

Dust emissions produced along the access corridor would be similar to those presented in Section 4.5.2.2.

If it is assumed that the transfer facility occupies an area of 4 acres and takes 3 weeks to construct. Dust emissions are then based upon those predicted for civil construction (i.e., 1.2 tons per month per acre disturbed. For this area, approximately 110 pounds of PM-10 dust would be generated on a daily basis. This assumes a control efficiency of 50 percent for active watering. During this period, it is assumed that excavation activities would be curtailed. If the entire 4 acres are to be paved, 248 truckloads of base material would be backhauled from the repository. If paving takes 1 week, 50 trucks would backhaul aggregate on a daily basis. Additionally, 124 trucks would be needed for asphalt deliveries. This would be delivered from off-site and would require an additional 25 trucks per day for the week. Dust would then be generated by these trips along the access corridor and by on-site operations. The total on-site volume of PM-10 dust is thus calculated at 256.4 pounds per day. This would constitute a significant adverse impact.

Mitigation Measures

Mitigations are as presented in Section 4.5.2.3 for the proposed action.

4.5.5.2 Subsequent Operations

Impacts

Exhaust Emissions

Under this alternative the same proportion of waste materials would be transferred to the site via train and truck as with the proposed project. However, for this alternative the train would be unloaded at Hector and the material would be off-loaded to trucks which would bring the materials through the access corridor to the site. For railroad operations, this would necessitate the use of intermodal containers placed on flat cars and would not allow the use of hopper cars thereby causing the need for additional rail cars. Railcars bound for the site would still be attached to trains traveling along I-40 and would contribute an insignificant amount of additional exhaust emissions to these trains.

As these trucks would be Applicant operated, their emissions could be construed as on-site emissions which would be subject to NSR and the significance criteria. Assuming that approximately 3/4 of the material is brought in by train would necessitate an additional 110 ADT along the access corridor over the proposed action. Based upon the 70 ADT and a 10-mile trek in each direction, an additional 1,100 miles per day of truck travel would be generated. This would result in additional exhaust emissions. The total emissions would then be as presented in Table 4.5-11.

Table 4.5-11

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE SUBSEQUENT OPERATION OF THE RAIL CONTAINER TRANSFER FACILITY ALTERNATIVE WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 8)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	59.3	44.8	750	No
Nitrogen Oxides (NOx as NO_2)	187.1	142.4	250	No
Reactive Organics	17.4	12.7	250	No
Sulfur Oxides (SOx as SO_2)	17.5	16.2	250	No
Particulate Matter	23.1	16.0	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	177.2	166.6
Nitrogen Oxides (NOx as NO_2)	392.0	389.7
Reactive Organics[3]	45.9	44.7
Sulfur Oxides[4] (SOx as SO_2)	11.7	61.8
Particulate Matter[4,5]	62.2	61.8

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

As shown in Table 4.5-11, exhaust emissions are greater for this alternative than for the proposed action due to the generation of exhaust pollutants from the extra haul trucks' travel along the access corridor. However, under this alternative the haul trucks which would be used to shuttle materials between the railcar off-load area and the facility would in all probability be owned and operated by the Applicant. Thus, the exhaust emissions directly attributable to these shuttle trips may be considered as project generated rather than beyond the control of the Applicant. If this is the case, "on-site" generated pollutant levels would rise for all pollutant species, but would still be insignificant by the impact criteria. The number of employees would also rise as additional workers would be necessary to drive and service these trucks. This addition, however, would be minimal as would be the additional emissions. All other exhaust emissions are anticipated to remain approximately the same as the proposed action.

Fugitive Dust

Dust generation for the facility and the access corridor would be essentially the same as for the transport by trucks only without rail spur alternative as presented in Section 4.5.4.3. However, the dust generated by the haul trucks bringing off-loaded containers could now be considered as on-site emissions that are subject to NSR and the criteria. Thus, these additional dust emissions would raise the level of project generated on-site dust by 87.1 pounds per day above that of the proposed action which would amount to 400.7 pounds per day. As with the proposed action this exceeds the criteria. All other on-site dust emissions would remain as described for the proposed action. In light of the fact that dust emission would already exceed significance criteria and constitute a significant adverse impact, additional dust would also constitute a significant adverse impact.

Mitigation Measures

Mitigations are as presented in Section 4.5.2.4 for the proposed action.

4.5.6 Access Corridor Alternatives

Under this alternative, the access corridor could take different alignments and be as much as 14 miles in length. These alignments will then add to the off-site generated pollutants and dust for all phases of construction and operation.

4.5.6.1 Impacts

During construction of access corridor, emissions are expected to remain the same on a daily basis with the disturbance lasting as much as 40 percent longer in duration or 18 days. When residuals are hauled to the facility, off-site exhaust pollutants could increase by about 3 percent and PM-10 dust would increase to 85.7 pounds (from 61.6 for proposed action) of PM-10 dust

per day. Off-site exhaust emissions are as presented in Table 4.5-12. All on-site exhaust and dust emissions are as presented for the proposed action.

4.5.6.2 Mitigation Measures

Mitigation measures are the same as for the proposed action.

4.5.7 Bristol Mountain Alternative Site

Under this alternative, a similar facility would be constructed in the Bristol Mountains. The Ludlow offramp from I-40 would be an additional 17 miles from Barstow and the proposed access corridor would be extended from the proposed 10 miles to 16 miles. On-site operations are as presented for the proposed project.

4.5.7.1 Initial Construction

Impacts

A discussion of the elements involved in the initial construction of this alternative are as presented for the proposed project. All on-site emissions (including fugitive dust) are as presented for the proposed project with the only difference being that the schedule would be extended from 45 days to 72 days for the construction of the access corridor. Phases 1, 2 and 3 would then have a combined time frame of 96 days as opposed to the 69 day time frame for the proposed action.

Off-site emissions would be increased by approximately 60 percent due to the Ludlow offramp being an additional 17 miles past the Hector ramp. Table 4.5-13 shows the difference in emissions due to the extended distance. Note that these off-site emissions are not considered in the NSR or the significance criteria, however, as they contribute to the regional airshed, they should be considered in the placement of the site.

Phases 4 and 5 initial construction on-site emissions are as presented for the proposed action. Off-site emissions are increased by approximately 60 percent due to the increased distance of the site. Table 4.5-14 and 4.5-15 present both on- and off-site emissions for these phases. No on-site emissions result from use of the alternative site.

Mitigation Measures

No impacts occur on-site and no mitigation is necessary.

Table 4.5-12

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, RESIDUALS HAULS AND WORKER COMMUTING INVOLVED IN THE SUBSEQUENT OPERATION OF THE ACCESS CORRIDOR ALTERNATIVE WITH SIMULTANEOUS REPOSITORY EXCAVATION (PHASE 8) BASED ON 14-MILE CORRIDOR

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide			750	No
Nitrogen Oxides (NOx as NO_2)			250	No
Reactive Organics			250	No
Sulfur Oxides (SOx as SO_2)			250	No
Particulate Matter			250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	172.5	166.6
Nitrogen Oxides (NOx as NO_2)	402.4	389.7
Reactive Organics[3]	46.2	44.7
Sulfur Oxides[4] (SOx as SO_2)	12.1	61.8
Particulate Matter[4,5]	63.8	61.8

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

Table 4.5-13

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, MATERIALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL CONSTRUCTION OF THE BRISTOL MOUNTAIN ALTERNATIVE (PHASES 1, 2 AND 3)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	37.3	37.3	750	No
Nitrogen Oxides (NOx as NO_2)	124.6	124.6	250	No
Reactive Organics	9.5	9.5	250	No
Sulfur Oxides (SOx as SO_2)	13.6	13.6	250	No
Particulate Matter	12.1	12.1	250	No

Pollutant	Daily Emissions[1] (lb/day)	
Off-Site Mobile Exhaust Emissions		
	Alter	Prop
Carbon Monoxide	127.2	79.5
Nitrogen Oxides (NOx as NO_2)	281.6	176.0
Reactive Organics[3]	33.1	20.7
Sulfur Oxides[4] (SOx as SO_2)	8.5	5.3
Particulate Matter[4,5]	44.6	27.9

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

Table 4.5-14

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, MATERIALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL CONSTRUCTION OF THE BRISTOL MOUNTAIN ALTERNATIVE (PHASE 4)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	54.1	54.1	750	No
Nitrogen Oxides (NOx as NO_2)	169.3	169.3	250	No
Reactive Organics	12.6	12.6	250	No
Sulfur Oxides (SOx as SO_2)	20.3	20.3	250	No
Particulate Matter	17.6	17.6	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	Daily Emissions[1] (lb/day)	
	Alter	Prop
Carbon Monoxide	118.6	74.1
Nitrogen Oxides (NOx as NO_2)	135.5	84.7
Reactive Organics[3]	22.1	13.8
Sulfur Oxides[4] (SOx as SO_2)	4.2	2.6
Particulate Matter[4,5]	21.6	13.5

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

Table 4.5-15

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, MATERIALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL CONSTRUCTION OF THE BRISTOL MOUNTAIN ALTERNATIVE (PHASE 5)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	48.6	48.6	750	No
Nitrogen Oxides (NOx as NO_2)	153.7	153.7	250	No
Reactive Organics	12.3	12.3	250	No
Sulfur Oxides (SOx as SO_2)	18.1	18.1	250	No
Particulate Matter	15.8	15.8	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	73.0	51.9
Nitrogen Oxides (NOx as NO_2)	73.0	45.6
Reactive Organics[3]	13.9	8.7
Sulfur Oxides[4] (SOx as SO_2)	2.2	1.4
Particulate Matter[4,5]	11.7	7.3

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

4.5.7.2 Initial Operations

Impacts

Exhaust Emissions

The initial operations phase (Phase 6) would involve the same operations as the proposed project with the only difference being in the haul and commute distances. Thus, on-site emissions are expected to remain as for the proposed action.

Off-site, mobile emissions would increase due to 1) employee commuting is extended by approximately 60 percent, 2) the shuttle bus commute would be extended 60 percent and 3) haul truck, would travel an additional 23 miles each direction or based upon an anticipated one-way trip length of 170 miles for the proposed site, an additional 13.5 percent. Table 4.5-16 presents the calculated emissions for the initial operational period.

Fugitive Dust

After production begins at the site aggregate would be back-hauled to the greater Los Angeles area. The access corridor could then be construed as an industrial haul road. As the access road would be 60 percent longer than that for the proposed project, dust emissions would also raise by 60 percent. Thus the off-site dust generated due to travel on the access corridor are expected to be approximately 148.6 pounds per day. On-site fugitive dust emissions are expected to be the same as for the proposed action.

Mitigation Measures

No mitigation measures are required as no on-site emissions would occur during this phase.

4.5.7.3 Subsequent Construction

Impacts

As with the proposed action, subsequent construction involves the construction of a railroad spur approximately two to three years after the facility is in operation. Aggregate would be back-hauled from the repository area for use as ballast. All worker haul traffic is as for the proposed site. However, additional exhaust pollutants would be produced due the extended length that the ballast would have to be delivered for use. With the proposed action, a 10 mile rail spur was considered and the average haul was considered 5 miles in each direction. With the Bristol Mountain site, the rail spur would be approximately 16 miles for an average haul of 8 miles in each direction. All other emissions are as for the proposed project except that the time required to install the spur would be extended by 60 percent. The calculated exhaust emissions are as presented in Table 4.5-17.

Table 4.5-16

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, MATERIALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL OPERATIONS OF THE BRISTOL MOUNTAIN ALTERNATIVE (PHASE 6)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	38.9	38.9	750	No
Nitrogen Oxides (NOx as NO_2)	124.1	124.1	250	No
Reactive Organics	10.2	10.2	250	No
Sulfur Oxides (SOx as SO_2)	14.4	14.4	250	No
Particulate Matter	12.7	12.7	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	320.0	256.4
Nitrogen Oxides (NOx as NO_2)	779.5	666.2
Reactive Organics[3]	88.1	73.6
Sulfur Oxides[4] (SOx as SO_2)	23.3	19.9
Particulate Matter[4,5]	123.6	105.5

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

Table 4.5-17

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATION, MATERIALS HAULS AND WORKER COMMUTING INVOLVED IN THE INITIAL OPERATIONS OF THE BRISTOL MOUNTAIN ALTERNATIVE WITH SIMULTANEOUS RAILROAD INSTALLATION (PHASE 7)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	53.9	44.5	750	No
Nitrogen Oxides (NOx as NO_2)	170.9	141.3	250	No
Reactive Organics	14.0	12.0	250	No
Sulfur Oxides (SOx as SO_2)	17.1	16.2	250	No
Particulate Matter	20.4	15.8	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	320.0	256.4
Nitrogen Oxides (NOx as NO_2)	779.5	666.2
Reactive Organics[3]	88.1	73.6
Sulfur Oxides[4] (SOx as SO_2)	23.3	19.9
Particulate Matter[4,5]	123.6	105.5

1 Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.
2 Alter/Prop - Alternative project/proposed project.
3 Based upon 90 percent of total organics for vehicle travel.
4 Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.
5 Includes exhaust, tire wear and brake wear PM-10 particular matter.

Also as shown in Table 4.5-17 on-site emissions are marginally higher for this alternative, though still insignificant by the criteria. No on-site impacts would occur under this alternative for this phase.

On-site produced fugitive dust would also be raised along the access corridor due to the longer haul distance to bring aggregate to the area of construction. Again, this is averaged at 8 miles as opposed to 5 miles for the proposed action. Assuming the same 80 haul trucks per day (and one water truck), an additional 32 pounds of PM-10 dust would be generated along the access corridor over that for the proposed action.

Mitigation Measures

No impacts would occur and no mitigation is required.

4.5.7.3 Subsequent Operations

Impacts

All subsequent operations are as presented for the proposed project. On-site emissions would be marginally higher due to the operation of the rail spur which would be 60 percent longer than with the proposed action. Off-site emissions would also be greater by virtue of the extended commute and haul distances. The calculated exhaust emissions are as presented in Table 4.5-18.

As shown in Table 4.5-18 on-site emissions are marginally higher for this alternative, though still insignificant by the impact criteria.

Mitigation Measures

No impacts occur on-site and no mitigation is required.

4.5.8 No Action Alternative

4.5.8.1 Impacts

Under the No Action Alternative the site would remain unchanged. No facility would be constructed, no access corridor would be installed and no railroad spur would be added. Thus, no impacts would occur and no mitigation would be necessary. It can be noted that residual haul-trucks would be forced to use other waste disposal sites and their associated air emissions would still be produced. Some of these sites would be located at further distances causing the production of higher levels of exhaust emissions, the single-most cause of air quality degradation associated with the project. The existing sites are not built to the same state-of-the-art as the

Table 4.5-18

PROJECT EMISSIONS FOR HEAVY EQUIPMENT OPERATIONS, MATERIALS HAULS AND WORKER COMMUTING INVOLVED IN THE SUBSEQUENT OPERATIONS OF THE BRISTOL MOUNTAIN ALTERNATIVE WITH SIMULTANEOUS RAILROAD INSTALLATION (PHASE 8)

Pollutant	Daily Emissions[1] (lb/day)		SBCAPCD Threshold Level (lb/day)	Exceeds Threshold
	Alter	Prop[2]		
On-Site Exhaust Emissions				
Carbon Monoxide	50.4	44.8	750	No
Nitrogen Oxides (NOx as NO_2)	158.1	142.4	250	No
Reactive Organics	13.1	12.7	250	No
Sulfur Oxides (SOx as SO_2)	20.0	16.2	250	No
Particulate Matter	17.7	16.0	250	No

Off-Site Mobile Exhaust Emissions		
Pollutant	**Daily Emissions[1] (lb/day)**	
	Alter	**Prop**
Carbon Monoxide	218.2	166.6
Nitrogen Oxides (NOx as NO_2)	465.6	389.7
Reactive Organics[3]	55.3	44.7
Sulfur Oxides[4] (SOx as SO_2)	14.0	11.6
Particulate Matter[4,5]	73.9	61.8

1 **Based on 1995 composite vehicle emissions factors and assumes and average temperature of 75°F and an average speed of 55 mph.**
2 **Alter/Prop - Alternative project/proposed project.**
3 **Based upon 90 percent of total organics for vehicle travel.**
4 **Mobile vehicle emission factors calculated by EMFAC7E Model as performed by Tom Lusk, Air Resources Engineer, California Air Resources Board, Sacramento, CA.**
5 **Includes exhaust, tire wear and brake wear PM-10 particular matter.**

proposed facility and utilize open dumping, a secondary cause of air pollution. In addition, many of these sites are near capacity. Thus, in lieu of the proposed project, air impacts may be considerably greater.

4.5.8.2 Mitigation Measures

No impacts would result under this alternative and no mitigation is required.

APPENDIX E2

AIR QUALITY IMPACTS CALCULATIONS

APPENDIX E2 - AIR QUALITY IMPACTS CALCULATIONS

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APPENDIX E2 - AIR QUALITY IMPACTS CALCULATIONS

This appendix is organized in such a fashion as to loosely follow the text. Numbered headings and subheadings specifically refer to those subsections within Section 4.5 of the text. Emission calculations are presented with an explanation of each of the emission factors used and its origin. In most cases where calculations have been repeated, the reader is referred back to the section where the calculation was first presented.

4.5 AIR QUALITY

4.5.2 Proposed Action

The construction and facility operations will be performed in eight phases. These are summarized below:

- Phase 1 - Hector to facility area access road construction
- Phase 2 - Facilities area to repository road construction
- Phase 3 - Facility area civil construction and paving
- Phase 4 - Facility area construction and repository excavation
- Phase 5 - Containment area construction and continuing repository excavation
- Phase 6 - Normal truck delivery operation with continuing containment area construction and repository excavation
- Phase 7 - Normal operation with railroad construction option and continuing containment area construction
- Phase 8 - Normal operation with truck and rail delivery, continuing containment area construction and repository excavation

Thus, Phases 1 through 5 are involved in the initial construction of the facility, Phase 6 is the initial occupancy, Phase 7 includes initial occupancy with simultaneous railroad construction and Phase 8 includes subsequent occupancy.

4.5.2.1 Initial Construction

Initial construction will encompass Phases 1 through 5. Phases 1 through 3 involve grading and paving. During this period (anticipated at approximately 69 days) the same assemblage of equipment and haul traffic (for paving materials) is expected. Therefore, emissions for this period will be similar.

Off-site Mobile Emissions Due to Vehicle Travel

ADT for Construction of the Access Corridor

The paved areas are to be constructed of 3 inches of asphaltic concrete over 6 inches of base. The access road length is to be 10 miles with a paved width of 24 feet.

For asphalt deliveries:

(3 in) x (1 ft/12 in) x (24 ft) x (10 mi) x (5,280 ft/mi) x (1 yd^3/27 ft^3) = 11,733 yd^3

Applicable road weights allow for approximately 20 tons of payload. Asphalt weighs approximately 3,000 pounds per cubic yard. Thus, trucks can haul 13 cubic yards per delivery.

(11,733 yd^3/13 yd^3/delivery) = (903 trips/45 days) = (20 deliveries per day x 2 trips per delivery) = 40 ADT

For base material deliveries:

(6 in) x (1 ft/12 in) x (24 ft) x (10 mi) x (5,280 ft/mi) x (1 yd^3/27 ft^3) = 23,467 yd^3

Base trucks also typically haul 13 cubic yards per delivery.

(23,467 yd^3/13 yd^3) = (1,805 trips/45 days) = (40 deliveries per day x 2 trips per delivery) = 80 ADT

For construction workers:

(26 workers) x (2 trips/worker) = 52 ADT

Total ADT = 40 ADT + 80 ADT + 52 ADT = 172 ADT

Exhaust Emissions

Auto and truck emissions are based upon EMFAC7PC (CO, NOx & TOG) and EMFAC7E (SOx & PM-10). The model is based upon a 1995 vehicle mix and assumes an average speed of 55 mph and a temperature of 75°F. Modeled results are presented below:

For autos:

Carbon monoxide	- 6.02 gm/mi
Nitrogen oxides	- 1.29 gm/mi
Total organics	- 0.81 gm/mi
Sulfur oxides	- 0.05 gm/mi
Particulates	- 0.215 gm/mi

For trucks:

Carbon monoxide	- 5.99 gm/mi
Nitrogen oxides	- 18.46 gm/mi
Total organics	- 2.14 gm/mi
Sulfur oxides	- 0.55 gm/mi
Particulates	- 2.92 gm/mi

Emissions per day

For autos:

Worker commute exhaust emissions are based upon 26 autos x 70 mi/round trip = 1,820 mi/day

Carbon monoxide - (6.02 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 24.1 lb/day
Nitrogen oxides - (1.29 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 5.2 lb/day
Reactive organics - (0.81 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) x (0.9 lb ROG/1 lb/ TOG) = 2.9 lb/day
Sulfur oxides - (0.05 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 0.2 lb/day
Particulates - (0.215 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 0.9 lb/day

For trucks:

Material hauls exhaust emissions are based upon 60 trucks x 70 mi/round trip = 4,200 miles/day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (4,200 mi/day) = 55.4 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (4,200 mi/day) = 170.8 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (4,200 mi/day) x (0.9 lb ROG/1 lb/TOG) = 17.8 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (4,200 mi/day) = 5.1 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (4,200 mi/day) = 27.0 lb/day

Total off-site mobile exhaust emissions per day:

Carbon monoxide - 79.5 lb/day
Nitrogen oxides - 176.0 lb/day
Reactive hydrocarbons - 20.7 lb/day
Sulfur oxides - 5.3 lb/day
PM-10 particulates - 27.9 lb/day

On-Site Exhaust Emissions for Phases 1 through 3

Heavy Equipment

Fuel Usage

Based upon AP-42, "Compilation of Air Pollutant Emission Factors, 1985", Table II-7.1, the average calculated power rating for the various types of heavy, earth-moving equipment is 190 horsepower. The average fuel consumption for this same machinery is approximately 12 gallons per hour. Assuming 10 pieces of heavy equipment operating 8 hours per day:

(10 pieces) x (8 hr/piece/day) x (12 gal/hr) = 960 gal/day

Exhaust Emissions

Construction is anticipated to require 10 pieces of heavy equipment and a water truck. Emissions factors are based upon the individual types of equipment as proposed by the applicant. These include two bull dozers, two scrapers, four graders and two rollers. Emission factors for this assemblage of equipment are as presented in AP-42, 1985, Table II-7.1 and are as presented below:

2 bull dozers X (8 hr/day) X (50.7 gm PM-10/hr) / (454 gm/lb) = 1.8 lb PM-10/day
2 bull dozers X (8 hr/day) X (55.06 gm HC/hr) / (454 gm/lb) = 1.9 lb HC/day
2 bull dozers X (8 hr/day) X (157.01 gm CO/hr) / (454 gm/lb) = 5.5 lb CO/day
2 bull dozers X (8 hr/day) X (570.7 gm NOx/hr) / (454 gm/lb) = 20.1 lb NOx/day
2 bull dozers X (8 hr/day) X (62.3 gm SOx/hr) / (454 gm/lb) = 2.2 lb SOx/day

2 scrapers X (8 hr/day) X (184 gm PM-10/hr) / (454 gm/lb) = 6.5 lb PM-10/day
2 scrapers X (8 hr/day) X (128.15 gm HC/hr) / (454 gm/lb) = 4.5 lb HC/day
2 scrapers X (8 hr/day) X (568.19 gm CO/hr) / (454 gm/lb) = 20.0 lb CO/day
2 scrapers X (8 hr/day) X (1,740.74 gm NOx/hr) / (454 gm/lb) = 61.3 lb NOx/day
2 scrapers X (8 hr/day) X (210 gm SOx/hr) / (454 gm/lb) = 7.4 lb SOx/day

4 graders X (8 hr/day) X (27.7 gm PM-10/hr) / (454 gm/lb) = 2.0 lb PM-10/day
4 graders X (8 hr/day) X (18.07 gm HC/hr) / (454 gm/lb) = 1.3 lb HC/day
4 graders X (8 hr/day) X (68.46 gm CO/hr) / (454 gm/lb) = 4.8 lb CO/day
4 graders X (8 hr/day) X (324.43 gm NOx/hr) / (454 gm/lb) = 22.9 lb NOx/day
4 graders X (8 hr/day) X (39.0 gm SOx/hr) / (454 gm/lb) = 2.7 lb SOx/day

2 rollers X (8 hr/day) X (22.7 gm PM-10/hr) / (454 gm/lb) = 0.8 lb PM-10/day
2 rollers X (8 hr/day) X (30.58 gm HC/hr) / (454 gm/lb) = 1.1 lb HC/day
2 rollers X (8 hr/day) X (137.97 gm CO/hr) / (454 gm/lb) = 4.9 lb CO/day
2 rollers X (8 hr/day) X (392.9 gm NOx/hr) / (454 gm/lb) = 13.8 lb NOx/day
2 rollers X (8 hr/day) X (30.5 gm SOx/hr) / (454 gm/lb) = 1.1 lb SOx/day

Additionally, a water truck will be utilized to keep dust emissions under control. This truck will make three excursions off-site to obtain water. The anticipated round trip is 50 miles. Further, a fuel truck will make one round trip per week to obtain heavy equipment fuel. Thus, heavy truck emissions are based on 3.2 round trips per day at 50 miles per trip or 160 miles per day. Emissions are based on heavy truck emission factors as presented below.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (160 mi/day) = 2.1 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (160 mi/day) = 6.5 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (160 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.7 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (160 mi/day) = 0.2 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (160 mi/day) = 1.0 lb/day

Totals for heavy equipment operations:

Carbon monoxide - 37.3 lb/day
Nitrogen oxides - 124.6 lb/day
Exhaust hydrocarbons - 9.5 lb/day
Sulfur oxides - 13.6 lb/day
PM-10 particulates - 12.1 lb/day

Construction dust

The access corridor will have a paved cross-section of 24 feet with 3 feet of shoulder on either side for an area of disturbance of 30 feet. Daily paving for the repository access road and for civil construction at the facility are encompass the same expanse as does the access road and will produce similar emissions. For the 10-mile route to be constructed in a 45 working day period, 1,170 feet will be constructed on a daily basis:

(30 ft) x (1,170 ft) x (1 ac/43,560 ft^2) = 0.8 acres

AP-42 predicts fugitive dust from civil construction at 1.2 tons per acre per month of activity for dust under 30 microns (AP-42, Section 11.2.4). This value will vary with soil moisture, silt content, wind speed and several other factors. The PM-10 portion is 45 percent of the PM-30. This value is based upon a 30 percent silt content. On-site sieve analysis determined the surface soil to contain an average of about 9 percent silt. The silt content was therefore reduced by 9/30. Additionally, this value is based upon a pan evaporation of 50 inches per year whereas the project site has a pan evaporation of 140 inches per year.
(0.8 ac/day) x (1.2 tons/ac/mo) x (2,000 lb/ton) x (9% silt/30% silt) x (45% PM-10/PM-30) x (140 PE/50 PE) x (1 mo/30 days) = 24.2 pounds of PM-10 dust per day

Assuming 50 percent control efficiency:

(24.2 lb/day) x (1-0.5) = 12.1 pounds of PM-10 dust per day

This value is applied to both the rough grading of the road and the spreading and compaction of road base and is therefor doubled to 24.2 pounds of PM-10 per day.

Additionally, a 2 mile section will be graded ahead of the equipment and remain inactive until the equipment is ready to move on to it.

(2 miles x 30 ft) x (5,280 ft/mi) x (1.2 tons/ac/mo) x (1 ac/43,560 ft^2) x (2,000 lb/ton) x (9% silt/30% silt) x (45% PM-10/PM-30) x (140 PE/50 PE) x (1 mo/30 days) = 220.0 pounds of PM-10 per day

Assuming 80 percent control efficiency for an inactive area:

(220.0 lb/day) x (1-0.8) = 44.0 pounds of PM-10 dust per day

Further, the material brought to the site will be dumped for road construction. AP-42, Section 8.19.1 lists batch drops from truck unloading generate 0.0024 lb of PM-10 emissions per ton unloaded. AP-42, Section A-4 lists gravel at 120 pounds per cubic foot.
Assuming that the 60 deliveries per day as described above each drop 13 yd^3:

(60 trucks/day) x (13 yd^3/truck) x (3,000 lb/yd^3) / (2,000 lb/ton) x (0.0024 lb of PM-10/ton) = 2.8 pounds of PM-10 per day

Additionally, travel on the unpaved working area will raise dust. It is estimated that 11 rough grade and five road base workers, the 40 base material trucks and five water and fuel trucks will travel over the 1,170 feet of working area. AP-42, Section 11.2.6 lists fugitive emissions from travel on unpaved roads. The equation is:

$E = k(5.9)\ (s/12)\ (S/30)\ (W/3)^{0.7}\ (w/4)^{0.5}\ (365-p/365)$ (lb/VMT)

where:

E = emission factor
k = particle size multiplier (dimensionless)
s = surface material silt content (%)
S = mean vehicle speed (mph)
W = average vehicle weight (tons)
w = mean number of wheels
p = number of days of precipitation per year

For haul trucks traveling along the newly graded road to supply paving materials, the calculated emission factor uses the following values:

k = 0.36 (for PM-10 particulates, from AP-42, Section 11.2.1)
s = 9% (from applicant field studies)
S = 15 mph
W = 30 tons (average of 40 tons full and 20 tons empty)
w = 18 wheels per truck
p = 20 days (from AP-42 rain areal distribution map, Section 11.2.1)

$E = 0.36(5.9)\ (9/12)\ (15/30)\ (30/3)^{0.7}\ (18/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 8.0 lb PM-10 per mile

For the 16 workers assuming an average vehicle weight of 1.5 tons:

$E = 0.36(5.9)\ (9/12)\ (15/30)\ (1.5/3)^{0.7}\ (4/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 0.5 lb PM-10 per mile

Water and fuel trucks will also be needed. Based upon typical capacity of 4,000 gallons per truck, five trucks with an anticipated truck weight of approximately 20 tons when full and 4 tons when empty for an average weight of 12 tons will be required. These trucks typically have 10 wheels. Due to the watering process, an average speed of 5 mph is anticipated.

$E = 0.36(5.9)\ (9/12)\ (5/30)\ (12/3)^{0.7}\ (10/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 1.0 lb PM-10 per mile

The total of all vehicles traveling on unpaved roads is then as follows:

((60 trucks/day) x (0.2 mi/trip) x (2 trips) x (8.0 lb/mi)) + ((16 workers/day) x (0.2 mi/trip) X (2 trips) x (0.5 lb/mi)) + ((5 trucks/day) x (0.2 mi/trip) x (2 trips) x (1.0 lb/mi)) = 197.2 pounds of PM-10 per day

Assuming that watering can reduce dust lofting by 50 percent, then the amount of PM-10 released into the atmosphere is calculated as:

(197.2 lb/day) x (1-0.5) = 98.6 pounds of PM-10 per day

This value when added to the dust generated by the actual construction is calculated as:

(71.0 lb/day) + (98.6 lb/day) = 169.6 pounds of PM-10 dust per day

The total PM-10 loading for construction is the combined PM-10 for dust and that from on-site construction equipment travel and exhaust emissions.

12.1 lb/day (for exhaust) + 169.6 lb/day (for dust) = 181.7 pounds of PM-10 per day.

Phase 4

Phase 4 involves the construction of the facility area with simultaneous repository excavation. The construction of the facility is considered civil construction whereas the excavation is similar to an open pit mine. This phase will utilize seven pieces of heavy equipment for a period anticipated at approximately 3.5 calendar months.

Mobile Emissions Due to Vehicle Travel

Exhaust Emissions

Auto and truck emissions are based upon EMFAC7PC (CO, NOx & TOG) and EMFAC7E (SOx & PM-10) and are as presented in Phases 1 through 3, above.

Emissions per day

For autos:

Worker commute exhaust emissions are based upon 54 autos x 70 mi/round trip = 3,780 mi/day

Carbon monoxide - (6.02 gm/mi) x (1 lb/454 gm) x (3,780 mi/day) = 50.1 lb/day
Nitrogen oxides - (1.29 gm/mi) x (1 lb/454 gm) x (3,780 mi/day) = 10.7 lb/day
Reactive organics - (0.81 gm/mi) x (1 lb/454 gm) x (3,780 mi/day) x (0.9 lb ROG/1.0 lb TOG) = 6.1 lb/day
Sulfur oxides - (0.05 gm/mi) x (1 lb/454 gm) x (3,780 mi/day) = 0.4 lb/day
Particulates - (0.215 gm/mi) x (1 lb/454 gm) x (3,780 mi/day) = 1.8 lb/day

For trucks:

Daily material hauls are based upon the following:

14 loads for aggregate
12 loads for concrete, water and construction materials

Exhaust emissions are based upon 26 trucks x 70 mi/round trip = 1,820 miles/day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 24.0 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 74.0 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) x (0.9 lb ROG/1 lb/TOG) = 7.7 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 2.2 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (1,820 mi/day) = 11.7 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide - 74.1 lb/day
Nitrogen oxides - 84.7 lb/day
Reactive hydrocarbons - 13.8 lb/day
Sulfur oxides - 2.6 lb/day
PM-10 particulates - 13.5 lb/day

Heavy Equipment

Fuel Usage

Average fuel usage for heavy equipment is as presented for Phases 1 through 3, above. Assuming 7 pieces of heavy equipment operating 8 hours per day:

(7 pieces) x (8 hr/piece/day) x (12 gal/hr) = 672 gal/day

Exhaust Emissions

Construction is anticipated to require seven pieces of heavy equipment and a water truck. Emissions factors are based upon the individual types of equipment as proposed by the applicant. These include one bull dozer, five scrapers and one grader. Emission factors for this assemblage of equipment are as presented in AP-42, 1985, Table II-7.1 and are as presented below:

1 bull dozer X (8 hr/day) X (50.7 gm PM-10/hr) / (454 gm/lb) = 0.9 lb PM-10/day
1 bull dozer X (8 hr/day) X (55.06 gm HC/hr) / (454 gm/lb) = 1.0 lb HC/day
1 bull dozer X (8 hr/day) X (157.01 gm CO/hr) / (454 gm/lb) = 2.8 lb CO/day
1 bull dozer X (8 hr/day) X (570.7 gm NOx/hr) / (454 gm/lb) = 10.1 lb NOx/day
1 bull dozer X (8 hr/day) X (62.3 gm SOx/hr) / (454 gm/lb) = 1.1 lb SOx/day

5 scrapers X (8 hr/day) X (184 gm PM-10/hr) / (454 gm/lb) = 16.2 lb PM-10/day
5 scrapers X (8 hr/day) X (128.15 gm HC/hr) / (454 gm/lb) = 11.3 lb HC/day
5 scrapers X (8 hr/day) X (568.19 gm CO/hr) / (454 gm/lb) = 50.1 lb CO/day
5 scrapers X (8 hr/day) X (1,740.74 gm NOx/hr) / (454 gm/lb) = 153.4 lb NOx/day
5 scrapers X (8 hr/day) X (210 gm SOx/hr) / (454 gm/lb) = 18.5 lb SOx/day

1 grader X (8 hr/day) X (27.7 gm PM-10/hr) / (454 gm/lb) = 0.5 lb PM-10/day
1 grader X (8 hr/day) X (18.07 gm HC/hr) / (454 gm/lb) = 0.3 lb HC/day
1 grader X (8 hr/day) X (68.46 gm CO/hr) / (454 gm/lb) = 1.2 lb CO/day
1 grader X (8 hr/day) X (324.43 gm NOx/hr) / (454 gm/lb) = 5.7 lb NOx/day
1 grader X (8 hr/day) X (39.0 gm SOx/hr) / (454 gm/lb) = 0.7 lb SOx/day

Additionally, a water truck will be utilized to keep dust emissions under control. Inactive areas will be treated with a dust palliative and will not require daily watering. Assuming that the active area is one acre, the receiving area (on the berm) is one acre and there's approximately 1,500 feet of roadway to be watered, the water truck must cover an area of about 2.5 acres with water twice daily. As the water truck will carry about 4,000 gallons:

(2.5 ac) x (43,560 ft^2/ac) x (1 yd^2/9 ft^2) x (0.5 gal/yd^2) = 6,050 gallons per watering

Thus, for two passes to be made per day for watering the site, three loads of water will be necessary. Assuming that the 2.5 acres is to be watered twice per day and that the water truck can spray an area 12 feet wide with each pass:

(2.5 ac) x (43,569 ft^2/ac) / (12 ft) x (1 mi/5,280 ft) = 1.7 miles per pass.

Thus, the water truck will cover 3.4 miles per day during on-site watering operations. Emissions are based on heavy truck emission factors as presented above.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.04 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.1 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.01 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.004 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) 0.02 lb/day

Totals for heavy equipment operations:

Carbon monoxide	- 54.1 lb/day
Nitrogen oxides	- 169.3 lb/day
Exhaust hydrocarbons	- 12.6 lb/day
Sulfur oxides	- 20.3 lb/day
PM-10 particulates	- 17.6 lb/day

Construction dust

Excavation of the repository area is estimated at 4,800 cubic yards per day. The area of active disturbance is anticipated at 1 acre per day while the total area of disturbance at the repository area at any one time is anticipated at 26.2 acres (Goddard & Goddard, March 27, 1991). Further, during this time the facility area will be constructed. This area is approximately 5.5 acres. Dust emissions are produced by construction equipment on the active areas and wind erosion on the exposed areas. AP-42, Section 8.24 gives emission factors for uncontrolled fugitive losses for open pit mining as well as loading and unloading of raw and aggregate materials. These emissions are based upon a materials moisture content of 1 to 2 percent. Five scrapers will be used to remove 4,800 cubic yards in a day. Dust emissions associated with the removal of soil and rock can be best approximated from emission factors generated from open pit coal mines as presented in AP-42, Section 8.24. Total suspended particulate losses for topsoil removal utilizing scrapers are presented as 0.058 lb of PM-30 dust per ton of material excavated. AP-42, Section 11.2.1 shows that PM-10 dust is 0.36/0.80 or 45 percent of PM-30 dust. Control efficiency is estimated at 50 percent.

(4,800 yd^3/day) x (2,700 lb/yd^3) / (2,000 lb/ton) x (0.058 lb PM-30/ton) x (0.45% PM-10/PM-30) = 169.1 pounds per day

And for the facility AP-42 estimates that each acre of disturbance produces 1.2 tons per month of disturbance:

(5.5 ac/3.5 mo) x (1.2 ton/ac/mo) x (2,000 lb/ton) x (9% silt/30% silt) x (50% PM-10/TSP) x (140 PE/50 PE) x (1 mo/30 days) = 52.8 pounds of PM-10 per day

Assuming that active watering can reduce these values by 50 percent:

((169.1 lb/day) + (52.8 lb/day)) x (1-0.5) = 111.0 pounds of PM-10 per day

Dust will also be generated as a result of wind erosion of the disturbed area. AP-42, Section 8.24 presents wind erosion for western states open pit coal mines as 0.38 tons of total suspended particulates per acre per year.

(26.2 ac/yr) x (0.38 ton/ac) x (45% PM-10/PM-30) x (2,000 lb/ton) x (1 yr/365 days) = 24.5 pounds of PM-10 per day

Assuming that active watering can reduce this value by 50 percent:

(27.3 lb/day)) x (1-0.5) = 13.6 pounds of PM-10 per day

Further, the material brought to the site will be dumped for facility area construction and concrete and the 160 loads for the scrapers from repository excavation will be dropped in the berm area. AP-42, Section 8.19.1 estimates that batch drops from truck unloading generate 0.0024 lb of PM-10 emissions per ton unloaded. AP-42, Section A-4 lists gravel at 120 pounds per cubic foot. Assuming 14 deliveries per day for aggregate each drop 13 yd^3:

(14 trucks/day) x (13 yd^3/truck) x (3,000 lb/yd^3) / (2,000 lb/ton) x (0.0024 lb of PM-10/ton) = 0.7 pounds of PM-10 per day

AP-42, Section 8.24.4 estimates that drops from scrapers generate 0.04 pounds of PM-30 dust per ton unloaded. AP-42, Section 11.2.1 shows that PM-10 dust is 0.36/0.80 or 45 percent of PM-30 dust.

(160 scraper loads/day) x (30 yd^3/scraper load) x (2,700 lb/yd^3) / (2,000 lb/ton) x (0.04 lb PM-30/ton) x (0.45% PM-10/PM-30 = 93.3 pounds of PM-10 per day

Additionally, travel on the unpaved working area will raise dust. It is estimated that 160 loads per day will be removed from the active area and bermed around the open pit. The entrance to the active area will be covered with gravel while the perimeter will be dirt. The equipment is to carry the soil from the active area to the berm and will drive over approximately 750 feet of gravel and 750 feet of dirt for a total trip of 3,000 feet per load.

For the scrapers removing soil from the active area and transferring it to the bermed area, the calculated emission factor for the dirt section (1,500 feet) is based upon AP-42, Table 8.24-2 and uses the following equation:

$PM\text{-}30 = 2.7 \times 10^{-5} (s)^{1.3} (W)^{2.4}$

Where:

s = silt content
W = weight

For the project:

s = 9% (from applicant field studies)
W = 40 tons (average of 60 tons full and 20 tons empty)

E = 3.3 lb PM-30 per mile

PM-10 = (PM-30 x 0.45) (From AP-42, Section 11.2.1)

PM-10 = 1.5 pounds per mile

And for the 1,500 feet of gravel road:

s = 5% (from AP-42, Section 11.2.1)

E = 1.5 pounds of PM-30

PM-10 = (PM-30 x 0.45)

PM-10 = 0.7 pound per mile

(160 loads) x ((1,500 ft/load) x (1 mi/5,280 ft) x (1.5 lb/mi) + (1,500 ft/load) x (1 mi/5,280 ft) x (0.7 lb/mi)) = 100.0 pounds per day

Assuming that watering can reduce dust lofting by 50 percent, then the amount of PM-10 released into the atmosphere is calculated as:

(100.0 lb/day) x (1-0.5) = 50.0 pounds per day

Water will be used for dust control. As shown above, the water truck is expected to travel 3.4 miles per day on-site. As per Phase 1, the water truck is expected to generate about 1.0 pounds of PM-10 dust per mile traveled.

(3.4 mi/day) x (1.0 lb/mi) = 3.4 pounds of PM-10 dust per day

Assuming that the water can reduce dust lofting by 50 percent:

(3.4 lb/day) x (1-0.5) = 1.7 pounds of PM-10 dust per day

In addition to emissions generated from the removal of soil, a 50 tons per hour concrete batch plant will be used to supply concrete for the silos. Particulate matter, consisting primarily of cement dust but including some aggregate and sand dust emissions, are the only pollutants of concern (AP-42, Section 8.10). All but one of the pollutant sources are fugitive in nature. The only point source is the transfer of cement, and this is usually vented to a fabric filter or a "sock". Fugitive sources include the transfer of sand and aggregate, truck loading, mixer loading, vehicle traffic and wind erosion from sand and aggregate piles. The extent of fugitive emissions generated during the transfer of sand and aggregate depends primarily on the surface moisture content of these materials.

AP-42 presents a composite of dust emissions for batch plants based on throughput. Batch plant particulate emissions (mainly of concrete dust) are presented as 0.2 and 0.02 pounds per cubic yard processed for uncontrolled and controlled facilities, respectively.

(50 tons/hr) x (8 hr/day) x 2,000 lb/ton) = 800,000 pound per day

(800,000 lb/day) x (1 ft^3/100 lb) x (1 yd^3/27 ft^3) = 296 cubic yards per day

As the batch plant will be a controlled facility:

(0.02 lb/yd^3) x (296 yd^3/day) = 5.9 pounds per day

If we assume that the material for the batch plant is to be stockpiled and allow a 25 percent overage for fines, then the stockpile will contain 370 cubic yards. AP-42, Section 8.19.1 lists PM-10 emissions from stockpile erosion as 6.3 lb/acre/day for active stockpiles and 1.7 lb/acre/day for inactive piles. As a worst case, the stockpile will be considered as active.

(370 yd^3) x (27 ft^3/yd^3) = 9,990 cubic feet

If we assume that for ease of handling that the stockpile forms a cylinder is no more than 10 feet high.

volume = pi hr^2

9,990 = pi x 10 x r^2

radius = 17.8 feet

If we then assume that the sides cave to a 45° angle the radius will be 22.8 feet

The area is then pi r^2:

(22.8^2) x (pi) / (43,560 ft^2/ac) = 0.04 acres

(6.3 lb/ac/day) x (0.04 ac) = 0.2 pounds

Assuming that watering can reduce these emission by 50 percent:

(0.2 lb) x (1-0.5) = 0.1 pound per day

The total PM-10 loading for the site is the combined PM-10 for dust from erosion, batch dumps, on-site truck travel, the batch plant and that for on-site construction equipment. This total amount of PM-10 generated on-site is calculated as:

(109.3 lb/day for active construction) + (13.7 lb/day for wind erosion including the stockpile) + (53.4 lb/day for on-site travel) + (5.9 lb/day for batch plant) + (17.6 lb/day for heavy equipment exhaust) = 199.9 pounds per day

Phase 5

Phase 5 involves the construction of the containment area with simultaneous repository excavation. This phase will also utilize seven pieces of heavy equipment.

Mobile Emissions Due to Vehicle Travel

Exhaust Emissions

Auto and truck emissions are based upon EMFAC7PC (CO, NOx & TOG) and EMFAC7E (SOx & PM-10) and are as presented in Phases 1 through 3, above.

Emissions per day

For autos:

Worker commute exhaust emissions are based upon 43 autos x 70 mi/round trip = 3,010 mi/day

Carbon monoxide	-	(6.02 gm/mi) x (1 lb/454 gm) x (3,010 mi/day) = 39.9 lb/day
Nitrogen oxides	-	(1.29 gm/mi) x (1 lb/454 gm) x (3,010 mi/day) = 8.6 lb/day
Reactive organics	-	(0.81 gm/mi) x (1 lb/454 gm) x (3,010 mi/day) x (0.9 lb ROG/1 lb/TOG) = 4.8 lb/day
Sulfur oxides	-	(0.05 gm/mi) x (1 lb/454 gm) x (3,010 mi/day) = 0.3 lb/day
Particulates	-	(0.215 gm/mi) x (1 lb/454 gm) x (3,010 mi/day) = 1.4 lb/day

For trucks:

Daily material hauls are based upon the following:

13 loads for cement, building materials and water

Exhaust emissions are based upon 13 trucks x 70 mi/round trip = 910 miles per day

Carbon monoxide	-	(5.99 gm/mi) x (1 lb/454 gm) x (910 mi/day) = 12.0 lb/day
Nitrogen oxides	-	(18.46 gm/mi) x (1 lb/454 gm) x (910 mi/day) = 37.0 lb/day
Reactive organics	-	(2.14 gm/mi) x (1 lb/454 gm) x (910 mi/day) x (0.9 lb ROG/1 lb/TOG) = 3.9 lb/day
Sulfur oxides	-	(0.55 gm/mi) x (1 lb/454 gm) x (910 mi/day) = 1.1 lb/day
Particulates	-	(2.92 gm/mi) x (1 lb/454 gm) x (910 mi/day) = 5.9 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide	- 51.9 pounds per day
Nitrogen oxides	- 45.6 pounds per day
Reactive hydrocarbons	- 8.7 pounds per day
Sulfur oxides	- 1.4 pounds per day
PM-10 particulates	- 7.3 pounds per day

ON-SITE EMISSIONS FOR PHASE 5

Heavy Equipment

Fuel Usage

As shown in Phase 1, the average fuel consumption for heavy equipment is approximately 12 gallons per hour. Assuming 7 pieces of heavy equipment operating 8 hours per day:

(7 pieces) x (8 hr/piece/day) x (12 gal/hr) = 672 gal/day

Exhaust Emissions

Construction is anticipated to require seven pieces of heavy equipment and a water truck. Emissions factors are based upon the individual types of equipment as proposed by the applicant. These include one bull dozer, four scrapers, one grader and one loader. Emission factors for this assemblage of equipment are as presented in AP-42, 1985, Table II-7.1 and are as presented below:

1 bull dozer X (8 hr/day) X (50.7 gm PM-10/hr) / (454 gm/lb) = 0.9 lb PM-10/day
1 bull dozer X (8 hr/day) X (55.06 gm HC/hr) / (454 gm/lb) = 1.0 lb HC/day
1 bull dozer X (8 hr/day) X (157.01 gm CO/hr) / (454 gm/lb) = 2.8 lb CO/day
1 bull dozer X (8 hr/day) X (570.7 gm NOx/hr) / (454 gm/lb) = 10.1 lb NOx/day
1 bull dozer X (8 hr/day) X (62.3 gm SOx/hr) / (454 gm/lb) = 1.1 lb SOx/day

4 scrapers X (8 hr/day) X (184 gm PM-10/hr) / (454 gm/lb) = 13.0 lb PM-10/day
4 scrapers X (8 hr/day) X (128.15 gm HC/hr) / (454 gm/lb) = 9.0 lb HC/day
4 scrapers X (8 hr/day) X (568.19 gm CO/hr) / (454 gm/lb) = 40.0 lb CO/day
4 scrapers X (8 hr/day) X (1,740.74 gm NOx/hr) / (454 gm/lb) = 122.7 lb NOx/day
4 scrapers X (8 hr/day) X (210 gm SOx/hr) / (454 gm/lb) = 14.8 lb SOx/day

1 grader X (8 hr/day) X (27.7 gm PM-10/hr) / (454 gm/lb) = 0.5 lb PM-10/day
1 grader X (8 hr/day) X (18.07 gm HC/hr) / (454 gm/lb) = 0.3 lb HC/day
1 grader X (8 hr/day) X (68.46 gm CO/hr) / (454 gm/lb) = 1.2 lb CO/day
1 grader X (8 hr/day) X (324.43 gm NOx/hr) / (454 gm/lb) = 5.7 lb NOx/day
1 grader X (8 hr/day) X (39.0 gm SOx/hr) / (454 gm/lb) = 0.7 lb SOx/day

1 loader X (8 hr/day) X (77.9 gm PM-10/hr) / (454 gm/lb) = 1.4 lb PM-10/day
1 loader X (8 hr/day) X (113.17 gm HC/hr) / (454 gm/lb) = 2.0 lb HC/day
1 loader X (8 hr/day) X (259.58 gm CO/hr) / (454 gm/lb) = 4.6 lb CO/day
1 loader X (8 hr/day) X (858.19 gm NOx/hr) / (454 gm/lb) = 15.1 lb NOx/day
1 loader X (8 hr/day) X (82.5 gm SOx/hr) / (454 gm/lb) = 1.5 lb SOx/day

Additionally, as shown in Phase 4 a water truck will cover 3.4 miles per day during on-site watering operations. Emissions are based on heavy truck emission factors as presented above.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.04 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.1 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.01 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.004 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) 0.02 lb/day

The total on-site exhaust emissions are then calculated as:

Carbon monoxide	- 48.6 pounds per day
Nitrogen oxides	- 153.7 pounds per day
Exhaust hydrocarbons	- 12.3 pounds per day
Sulfur oxides	- 18.1 pounds per day
PM-10 particulates	- 15.8 pounds per day

Construction Dust

Soil removal

AP-42, Section 8.24 gives emission factors for uncontrolled fugitive losses for open pit mining as well as loading and unloading of raw and aggregate materials. These emissions are based upon a materials moisture content of 1 to 2 percent. An estimated 128 loads for the scrapers from repository excavation (Goddard and Goddard) will be dropped in the berm area or rock plant. AP-42, Section 8.24-4 estimates scraper emissions at 0.058 pounds of PM-30 dust per ton of material excavated. Further, scraper drops are estimated at 0.04 pounds of PM-30 per ton unloaded. Through watering a control efficiency of 50 percent can be attained.

(128 loads) x (30 yd^3/load) x (2,700 lb/yd^3) / (2,000 lb/ton) x (0.058 lb PM-30/ton) x (0.45% PM-10/PM-30) x (1-0.5) = 67.7 pounds of PM-10 per day

(128 loads) x (30 yd^3/load) x (2,700 lb/yd^3) / (2,000 lb/ton) x (0.04 lb PM-30/ton) x (0.45% PM-10/PM-30) x (1-0.5) = 46.7 pounds of PM-10 per day

Additionally, a bull dozer will be utilized. AP-42, Section 8.24 lists PM-30 dust emissions due to bull dozer operations as:

$$\frac{5.7\ (s)^{1.2}}{(M)^{1.3}}$$

Where:

s = silt content (%)
M = moisture content

For the 9 percent silt and an assumed 5 percent moisture, PM-30 dust is calculated at 9.8 pounds per hour.

(9.8 lb PM-30/hr) x (45% PM-10/PM-30) x (8 hr/day) x (1-0.5) = 17.6 pounds of PM-10 per day

Assuming that the loader will produce similar emissions, this value is doubled to 35.2 pounds per day

Grader emissions are presented in AP-42, Section 8.24 as:

PM-30 dust = $0.04\ (s)^{2.5}$

Where:

s = silt content

(0.04) x $(9\%)^{2.5}$ x (45% PM-10/PM-30) = 4.4 pounds of PM-10 dust per mile

Assuming that the grader averages 3 miles per hour and watering can attain a control efficiency of 50 percent:

(4.4 lb/mi) x (3 mi/hr) x (8 hr) x (1-0.5) = 52.8 pounds of PM-10 per day

Dust will also be generated as a result of wind erosion of the disturbed area.

(40 ac/yr) x (0.38 ton/ac) x (45% PM-10/PM-30) x (2,000 lb/ton) x (1 yr/365 days) = 37.5 pounds per day

Assuming that active watering can reduce this value by 50 percent:

(37.5) x (1-0.5) = 18.7 pounds per day

Additionally, travel on the unpaved working area will raise dust. An estimated that 128 loads per day will be removed from the active area and bermed around the open pit. The entrance to the active area will be covered with gravel while the perimeter will be dirt. The equipment is to carry the soil from the active area to the berm and will drive over approximately 750 feet of gravel and 750 feet of dirt for a total trip of 3,000 feet per load. As shown in Phase 4, for travel over dirt and gravel, PM-10 scraper emissions are 1.5 and 0.7 pounds per mile, respectively. Control efficiency is estimated at 50 percent.

(128 loads) x ((1,500 ft/load) x (1 mi/5,280 ft) x (1.5 lb/mi) + (1,500 ft/load) x (1 mi/5,280 ft) x (0.7 lb/mi)) x (1-0.5) = 40.0 pounds per day

Water and will also be needed. Water truck dust generation is as presented in Section 4.5.2.1, above and is 1.0 pound of PM-10 per mile. Assuming that 2.5 acres is to be watered twice per day and that the water truck can spray an area 12 feet wide with each pass:

(2.5 ac) x (43,569 ft^2/ac) / (12 ft) x (1 mi/5,280 ft) = 1.7 miles per pass. Thus the water truck will cover 3.4 miles per day.
Assuming that the water can reduce dust lofting by 50 percent:

(3.4 mi) x (1.0 lb PM-10/mi) x (1-0.5) = 1.7 pounds per day

Rock Plant Emissions

The quarried materials will be used to produce aggregate for the production of concrete for silo construction. After reaching the plant the stone is typically dumped into a hoppered feeder (usually a vibrating grizzly type) or onto screens. These screens separate large boulders from finer rocks that do not require primary crushing. Further screening generally separates the process flow to either two or three fractions (oversize, undersize and throughs) ahead of a secondary crusher for further reduction where necessary. The product of the secondary crusher is sent to screens for further sizing. Depending upon rock type, tertiary crushing may also be necessary. End products of the desired grade are conveyed directly to product bins, to open stockpiles or trucked out of the facility. In certain cases, stone washing is required to meet particular end product specifications or demands, as with concrete aggregate processing.

AP-42 gives emission factors for uncontrolled fugitive losses for crushing operations as well as loading and unloading of raw and aggregate materials based upon plant throughput. These emissions are based upon a materials moisture content of 1 to 2 percent. HVR throughput is estimated at 400 tons per day. Assuming an additional 25 percent for fines which are removed, the daily throughput is 500 tons per day.

Once the rock reaches the plant, subsequent dust emissions result from crushing, screening, truck loading and unloading, conveyors and from exposed piles of aggregate. Emissions for each of these operations is presented below:

Crushing

AP-42, Section 8.19.2 lists PM-10 emissions from stone crushing operations as 0.017 lb/ton processed.

(500 tons/day) x (0.017 lb/ton) = 8.5 pounds per day

Screening

AP-42, Section 8.19.1 lists PM-10 emissions from screening operations as 0.12 lb/ton processed.

(500 tons/day) x (0.12 lb/ton) = 60.0 pounds per day

Loading

AP-42, Section 8.19.1 lists PM-10 emissions from loading operations as 0.0024 lb/ton processed.

(500 tons/day) x (0.0024 lb/ton) = 1.2 pounds per day

Control Efficiency

Based upon the anticipated throughput, uncontrolled PM-10 emissions are calculated at approximately 69.7 lb per day. Wet processing can reduce emissions by 70 to 95 percent (AP-42, 1985). Thus, assuming an average control efficiency of 82.5 percent:

(69.7 lb/day) x (1-0.825) = 12.2 pounds of PM-10 dust per day

Thus, for an average, a controlled facility would be expected to produce approximately 12.2 pounds of PM-10 emissions per day.

Stockpiles

Assuming that the 500 tons will be stockpiled:

(500 tons) x (2,000 lb/ton) / (2,700 lb/yd^3) = 370 cubic yards

(370 yd^3) x (27 ft^3/yd^3) = 9,990 cubic feet

If we assume that for ease of handling that the stockpile forms a cylinder is no more than 10 feet high.

volume = pi hr^2

9,990 = pi x 10 x r^2

radius = 17.8 feet

If we then assume that the sides cave to a 45° angle the radius will be 22.8 feet

The area is then pi r^2:

(22.8^2) x (pi) / (43,560 ft^2/ac) = 0.04 acres

(6.3 lb/ac/day) x (0.04 ac) = 0.2 pounds of PM-10 dust per day

Assuming that watering can reduce these emission by 50 percent:

(0.2 lb) x (1-0.5) = 0.1 pound of PM-10 dust per day

Batch Plant

The concrete batch plant will continue to operate at a rate of 50 tons per hour and expected emissions are 5.9 pounds of PM-10 per day as presented in Phase 4, above.

The total PM-10 loading for the site is the combined PM-10 for dust from erosion, construction equipment exhaust emissions, on- and off-site truck and worker travel and the rock and batch plants and that for on-site construction equipment. This total amount of PM-10 generated on-site is calculated as:

(244.1 lb/day for active construction) + (18.8 lb/day for wind erosion) + (12.2 lb/day for rock plant) + (5.9 lb/day for batch plant) + (15.8 lb/day for heavy equipment) + (7.3 lb/day for off-site travel) = 298.2 pounds of PM-10 per day

4.5.2.2 Initial Operations

The initial operations included in Phase 6 involve the normal operation of the facility with continuing construction of the containment area and simultaneous repository excavation. At this point the facility will begin to receive residual and clean-up wastes at a rate of 45 trucks or 900 cubic yards per day. This phase will utilize six pieces of heavy equipment.

Exhaust Emissions for Off-Site Vehicle Travel

Upon project completion, a work force of 58 will be used to staff the facility. For the first two years of operation about 45 trucks per day will deliver wastes to the facility. Twelve additional trucks per day are anticipated for silo construction and miscellaneous materials and water deliveries.

(58 employees + 57 trucks) x (2 ADT/vehicle) = 230 ADT

The break-down is as follows:

- 58 two-way vehicle trips for employee commuting (average 35 miles each direction).
- 45 two-way heavy truck trips for waste deliveries (average 170 miles each direction).
- 12 two-way heavy truck trips for miscellaneous deliveries (at 35 miles each way).

Auto and truck emissions are based upon EMFAC7PC (CO, NOx & TOG) and EMFAC7E (SOx & PM-10) and are as presented in Section 4.5.2.1, above. Bus emissions are based upon AP-42, Table N-1 and are as presented below:

For bus:

Carbon monoxide	- 51.9 gm/mi
Nitrogen oxides	- 26.1 gm/mi
Hydrocarbons	- 3.35 gm/mi
Sulfur oxides	- No value given
Particulates	- 5.52 gm/mi

For employees:

Worker commute exhaust emissions are based upon 58 employees traveling an average round trip distance of 70 miles, 10 employees traveling a round trip distance of 70 miles and one bus averaging 20 miles a day to shuttle employees from Hector to the site.

((58 emp) x (70 mi/emp)) = 4,060 miles per day

Carbon monoxide	-	(6.02 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 53.8 lb/day
Nitrogen oxides	-	(1.29 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 11.5 lb/day
Reactive organics	-	(0.81 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) x (0.9 lb ROG/1 lb/TOG) = 6.5 lb/day
Sulfur oxides	-	(0.05 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 0.4 lb/day
Particulates	-	(0.215 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 1.9 lb/day

For truck emissions:

Daily material hauls are based upon the following:

45 loads of residuals
12 loads for cement, building materials, and water

Exhaust emissions are based upon 12 trucks at 70 miles per round trip for cement, building materials and water and 45 trucks at an anticipated 340 miles per round trip for a daily total of 16,140 miles per day.

Carbon monoxide	-	(5.99 gm/mi) x (1 lb/454 gm) x (16,140 mi/day) = 213.0 lb/day
Nitrogen oxides	-	(18.46 gm/mi) x (1 lb/454 gm) x (16,140 mi/day) = 656.3 lb/day
Reactive organics	-	(2.14 gm/mi) x (1 lb/454 gm) x (16,140 mi/day) x (0.9 lb ROG/1 lb/TOG) = 68.5 lb/day
Sulfur oxides	-	(0.55 gm/mi) x (1 lb/454 gm) x (16,140 mi/day) = 19.6 lb/day
Particulates	-	(2.92 gm/mi) x (1 lb/454 gm) x (16,140 mi/day) = 103.8 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide	- 266.8 pounds per day
Nitrogen oxides	- 667.8 pounds per day
Reactive hydrocarbons	- 75.0 pounds per day
Sulfur oxides	- 20.0 pounds per day
PM-10 particulates	- 105.7 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

Dust will be generated along the access corridor from automobiles and heavy trucks which access the site. AP-42 states that dust emissions from industrial paved roads are a major component of particulate matter in the vicinity of industrial operations. Further, the quantity of dust raised is directly proportional to the volume of traffic and the surface dust loading.

Based upon AP-42, Section 11.2.6.3, dust which is "kicked-up" by the tires of haul trucks and employee traffic can be calculated using the equation:

$E = 0.077\ I\ (4/n)\ (s/10)\ (L/1{,}000)\ (W/3)^{0.7}$ (lb/VMT)

where:

E = emission factor
I = industrial augmentation factor (dimensionless)
n = number of traffic lanes
s = surface material silt content (%)
L = surface dust loading (lb/mile)
W = average vehicle weight (tons)

For haul trucks, automobiles and the bus traveling along the site access road from Hector, the calculated emission factor uses the following values:

I = 1.0 (This factor assumes that traffic does not travel on unpaved surfaces.)
n = 2 lanes
s = 9% (approximate average from Applicant studies)
L = 13.3 lb/mi (from AP-42)
W = 39.5 tons for trucks, 1.5 tons for automobiles and 23 tons for the bus

<u>For trucks</u>:

$E = 0.077\ 1\ (4/2)\ (9/10)\ (13.3/1{,}000)\ (39.5/3)^{0.7}$ (lb/VMT)

E = 0.011 pounds per mile

(57 trucks/day) x (2 trips/truck) x (10 mi/trip) = 1,140 miles per day

(1,140 miles/day) x (0.011 lb/mi) = 12.5 pounds per day

<u>For autos</u>:

$E = 0.077\ 1\ (4/2)\ (9/10)\ (13.3/1{,}000)\ (1.5/3)^{0.7}$ (lb/VMT)

E = 0.001 pounds per mile

(58 autos/day) x (2 trips/auto) x (10 mi/trip) = 200 miles per day

(200 miles/day) x (0.001 lb/mi) = 1.2 pounds per day

Total dust generated along the access corridor:

(12.5 lb + 1.2 lb) x (0.45% PM-10/PM-30) = 6.2 pounds of PM-10 per day

On-site Operations

Heavy Equipment

Fuel Usage

The average fuel consumption for this same machinery is approximately 12 gallons per hour. Assuming six pieces of heavy equipment operating 8 hours per day:

(6 pieces) x (8 hr/piece/day) x (12 gal/hr) = 576 gal/day

Exhaust Emissions

Construction is anticipated to require six pieces of heavy equipment and a water truck. Emissions factors are based upon the individual types of equipment as proposed by the applicant. These include one bull dozer, three scrapers, one grader and one loader. Emission factors for this assemblage of equipment are as presented in AP-42, 1985, Table II-7.1 and are as presented below:

1 bull dozer X (8 hr/day) X (50.7 gm PM-10/hr) / (454 gm/lb) = 0.9 lb PM-10/day
1 bull dozer X (8 hr/day) X (55.06 gm HC/hr) / (454 gm/lb) = 1.0 lb HC/day
1 bull dozer X (8 hr/day) X (157.01 gm CO/hr) / (454 gm/lb) = 2.8 lb CO/day
1 bull dozer X (8 hr/day) X (570.7 gm NOx/hr) / (454 gm/lb) = 10.1 lb NOx/day
1 bull dozer X (8 hr/day) X (62.3 gm SOx/hr) / (454 gm/lb) = 1.1 lb SOx/day

3 scrapers X (8 hr/day) X (184 gm PM-10/hr) / (454 gm/lb) = 9.7 lb PM-10/day
3 scrapers X (8 hr/day) X (128.15 gm HC/hr) / (454 gm/lb) = 6.8 lb HC/day
3 scrapers X (8 hr/day) X (568.19 gm CO/hr) / (454 gm/lb) = 30.0 lb CO/day
3 scrapers X (8 hr/day) X (1,740.74 gm NOx/hr) / (454 gm/lb) = 92.0 lb NOx/day
3 scrapers X (8 hr/day) X (210 gm SOx/hr) / (454 gm/lb) = 11.1 lb SOx/day

1 grader X (8 hr/day) X (27.7 gm PM-10/hr) / (454 gm/lb) = 0.5 lb PM-10/day
1 grader X (8 hr/day) X (18.07 gm HC/hr) / (454 gm/lb) = 0.3 lb HC/day
1 grader X (8 hr/day) X (68.46 gm CO/hr) / (454 gm/lb) = 1.2 lb CO/day
1 grader X (8 hr/day) X (324.43 gm NOx/hr) / (454 gm/lb) = 5.7 lb NOx/day
1 grader X (8 hr/day) X (39.0 gm SOx/hr) / (454 gm/lb) = 0.7 lb SOx/day

1 loader X (8 hr/day) X (77.9 gm PM-10/hr) / (454 gm/lb) = 1.4 lb PM-10/day
1 loader X (8 hr/day) X (113.17 gm HC/hr) / (454 gm/lb) = 2.0 lb HC/day
1 loader X (8 hr/day) X (259.58 gm CO/hr) / (454 gm/lb) = 4.6 lb CO/day
1 loader X (8 hr/day) X (858.19 gm NOx/hr) / (454 gm/lb) = 15.1 lb NOx/day
1 loader X (8 hr/day) X (82.5 gm SOx/hr) / (454 gm/lb) = 1.5 lb SOx/day

Additionally, a water truck will be utilized to keep dust emissions under control. As shown in Section 4.5.2.1, the water truck will cover 3.4 miles per day during on-site watering operations.

Carbon monoxide	-	(5.99 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.04 lb/day
Nitrogen oxides	-	(18.46 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.1 lb/day
Reactive organics	-	(2.14 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.01 lb/day
Sulfur oxides	-	(0.55 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) = 0.004 lb/day
Particulates	-	(2.92 gm/mi) x (1 lb/454 gm) x (3.4 mi/day) 0.02 lb/day

On-site Haul Truck Exhaust Emissions

Received material will be screened in the laboratory before being trucked to the receiving structure. From here the sorted materials will be transferred to the containment area by covered conveyor, rail or truck. A worst case scenario assumes that all of the material is transferred by truck. The number of trucks would be equal to the number of trucks bringing wastes to the facility (i.e., 45). These trucks will transport the sorted materials a distance of approximately 1,500 feet. A return trip brings this trip up to 3,000 feet for a total of about 26 miles for the 45 loads.

Carbon monoxide	-	(5.99 gm/mi) x (1 lb/454 gm) x (26 mi/day) = 0.3 lb/day
Nitrogen oxides	-	(18.46 gm/mi) x (1 lb/454 gm) x (26 mi/day) = 1.1 lb/day
Reactive organics	-	(2.14 gm/mi) x (1 lb/454 gm) x (26 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.1 lb/day
Sulfur oxides	-	(0.55 gm/mi) x (1 lb/454 gm) x (26 mi/day) = 0.03 lb/day
Particulates	-	(2.92 gm/mi) x (1 lb/454 gm) x (26 mi/day) = 0.2 lb/day

The total on-site exhaust emissions per day are:

Carbon monoxide	- 38.9 pounds per day
Nitrogen oxides	- 124.1 pounds per day
Reactive hydrocarbons	- 10.2 pounds per day
Sulfur oxides	- 14.4 pounds per day
PM-10 particulates	- 12.7 pounds per day

Fugitive Dust Emissions for On-Site Vehicle Travel and Operations

Vehicle Travel

Dust will be generated along the interior access road which extends from the receiving building to the repository site, a distance of about 1,500 feet. Approximately half of this travel will be over paved road while the other half will be over maintained gravel roads. AP-42 states that dust emissions from industrial paved roads are a major component of particulate matter in the vicinity of industrial operations. Further, the quantity of dust raised is directly proportional to the volume of traffic and the surface dust loading. The number of trucks would be equal to the number of trucks bringing wastes to the facility (i.e., 45). As mentioned, these trucks will transport the sorted materials a distance of approximately 1,500 feet. A return trip brings this trip up to 3,000 feet for a total of about 26 miles for the 45 loads.

Trucks received at the facility will unload within an enclosed building. Emissions will be controlled via forced air and baghouse so external emissions will be insignificant. The materials will be transported to the silos via an enclosed conveyor system. In lieu of this system, on-site haul trucks may be used. For the purposes of this analysis haul trucks are considered to carry 20 tons as do the internal on-site haul trucks. Additionally, both are assumed to have similar emission factors.

$E = 0.077\ I\ (4/n)\ (s/10)\ (L/1{,}000)\ (W/3)^{0.7}$ (lb/VMT)

where:

E = emission factor
I = industrial augmentation factor (dimensionless)
n = number of traffic lanes
s = surface material silt content (%)
L = surface dust loading (lb/mile)
W = average vehicle weight (tons)

For haul trucks and automobiles traveling along the internal repository road, the calculated emission factor uses the following values:

I = 1.0 (This factor is used for trucks that will not travel off of paved surfaces. As the client intends regular flushing of the interior roads, this factor will be used here.)
n = 2 lanes
s = 9%
L = 1,330 lb/mi (from AP-42)
W = 30 tons (assumes an average of 40 tons full and 20 tons empty)
$E = 0.077\ 1\ (4/2)\ (9/10)\ (1{,}330/1{,}000)\ (30/3)^{0.7}$ (lb/VMT)
E = 0.9 lb/mile

(45 trucks/day) x (2 trips/truck) x (750 ft/trip) x (1 mi/5,280 ft) = 12.8 miles per day
(12.8 miles/day) x (0.9 lb/mi) = 11.5 pounds per day

Daily flushing of the paved road should attain an efficiency of at least 80 percent. Further, the PM-10 dust comprises approximately 36 percent of this total dust.

(11.5 lb/day) x (36%) x (1-0.8) = 0.8 pounds per day

Additionally, these trucks will pass over gravel roads on their way to the repository. This is estimated at additional 1,500 feet in both directions. The equation for travel on unpaved roads is presented below:

$E = k(5.9)\ (s/12)\ (S/30)\ (W/3)^{0.7}\ (w/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

where:

E = emission factor
k = particle size multiplier (dimensionless)
s = surface material silt content (%)
S = mean vehicle speed (mph)
W = average vehicle weight (tons)
w = mean number of wheels
p = number of days of precipitation per year

For the 1,500 feet of gravel road:

s = 5% (from AP-42, Section 11.2.1)

$E = 0.36\ (5.9)\ (5/12)\ (15/30)\ (30/3)^{0.7}\ (18/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 4.4 pounds of PM-10 dust per mile

(45 trucks/day) x (2 trips/truck) x (750 ft/trip) x (1 mi/5,280 ft) = 12.8 miles per day

(12.8 miles/day) x (4.4 lb/mi) = 56.3 pounds of PM-10 dust per day

Daily watering of the gravel road should attain an efficiency of at least 80 percent.

(56.3 lb PM-10/day) x (1-0.8) = 11.3 pounds of PM-10 dust per day

Other On-site Operations

Scrapers

AP-42, Section 8.24 gives emission factors for uncontrolled fugitive losses for open pit mining as well as loading and unloading of raw and aggregate materials. These emissions are based upon a materials moisture content of 1 to 2 percent. During this phase, 96 loads of 30 cubic yards (2,880 cubic yards) will be excavated in a day. Dust emissions associated with the removal of soil and rock can be best approximated from emission factors generated from open pit coal mines as presented in AP-42, Section 8.24. Total suspended particulate losses for topsoil removal utilizing scrapers are presented as 0.058 lb per ton of material excavated while unloading is presented as 0.04 pounds of PM-30 per ton. Control efficiency is estimated at 50 percent.

(2,880 yd^3/day) x (2,700 lb/yd^3) / (2,000 lb/ton) x (0.058 lb PM-30/ton) x (0.45% PM-10/PM-30) x (1-0.5) = 50.7 pounds of PM-10 per day

(2,880 yd^3/day) x (2,700 lb/yd^3) / (2,000 lb/ton) x (0.04 lb of PM-30/ton) x (0.45% PM-10/TSP) x (1-0.5) = 35.0 pounds of PM-10 per day

The scrapers will also create dust emissions in their travel from the active area to either the rock plant or to the bermed area.

Dust emissions due to scraper travel are as calculated in AP-42, Section 8.24.1 and are calculated using the following methodology:

$PM\text{-}30\ dust = 9.6 \times 10^{-6}\ (s)^{1.3}\ (W)^{2.4}$

Where:

s = material silt content (%)

W = mean vehicle weight (20 tons tare and 60 tons loaded, average 40 tons)

Based upon Applicant studies, the on-site silt content is approximately 9 percent for the 1,500 feet of soil travel and 5 percent for the 1,500 of travel over gravel.

PM-30 = 2.7×10^{-5} $(9\%)^{1.3}$ x $(40)^{2.4}$

PM-30 = 3.3 pounds per mile

PM-10 = PM-30 x 45%

PM-10 = 1.5 pounds per mile

(96 loads) x (1,500 ft/load) / (5,280 ft/mi) x (1.5 lb/mi) = 40.9 pounds per day

Assuming that watering can reduce these emissions by 50 percent:

(40.9 lb/day) x (1-0.5) = 20.5 pounds per day

And for the 1,500 of gravel:

PM-30 = 2.7×10^{-5} $(5\%)^{1.3}$ x $(40)^{2.4}$

PM-30 = 1.5 pounds per mile

PM-10 = PM-30 x 45%

PM-10 = 0.7 pounds per mile

(96 loads) x (1,500 ft/load) / (5,280 ft/mi) x (0.7 lb/mi) = 19.1 pounds per day

Assuming that watering can reduce these emissions by 80 percent:

(19.1 lb/day) x (1-0.8) = 3.8 pounds of PM-10 dust per day

PM-10 dust = 20.5 lb/day + 3.8 lb/day = 24.3 pounds per day

Bull dozers

Additionally, a bull dozer will be utilized. AP-42, Section 8.24 lists PM-30 dust emissions due to bull dozer operations as:

$$\frac{5.7\ (s)^{1.2}}{(M)^{1.3}}$$

Where:

s = silt content (%)
M = moisture content

For the 9 percent silt and an assumed 5 percent moisture, PM-30 dust is calculated at 9.8 pounds per hour.

(9.8 lb PM-30/hr) x (0.45 lb PM-10/lb PM-30) x (8 hr/day) x (1-0.5) = 17.6 pounds of PM-10 per day

Assuming that the loader will produce similar emissions, this value is doubled to 35.2 pounds per day

Graders

Grader emissions are presented in AP-42, Section 8.24 as:

PM-30 dust = $0.04\ (s)^{2.5}$

Where:

s = silt content

$(0.04) \times (9\%)^{2.5} \times (0.45$ lb PM-10/lb PM-30) = 4.4 pounds of PM-10 dust per mile

Assuming that the grader averages 3 miles per hour and watering can attain a control efficiency of 50 percent:

(4.4 lb/mi) x (3 mi/hr) x (8 hr) x (1-0.5) = 52.8 pounds of PM-10 per day

Water trucks

As discussed above, the water truck is expected to drive about 3.4 miles per day with an anticipated truck weight of approximately 20 tons when full and 4 tons when empty for an average weight of 12 tons. These trucks will travel over paved and graveled roads and, in the excavation area, dirt. These trucks typically have 10 wheels. Assuming a worst case scenario, the entire 3.4 miles were assumed to be over dirt. The average speed is anticipated at 5 miles per hour:

$E = 0.36\ (5.9)\ (9/12)\ (5/30)\ (12/3)^{0.7}\ (10/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 1.0 pounds of PM-10 per mile

(3.4 mi/day) x (1.0 lb/mi) = 3.4 pounds of PM-10 per day

Assuming that the water can reduce dust lofting by 50 percent:

(3.4 lb/day) x (1-0.5) = 1.7 pounds of PM-10 per day

On-site haul trucks batch drops:

AP-42, Section 8.19.1 lists batch drops from truck unloading generate 0.0024 lb of PM-10 emissions per ton unloaded. This factor would apply to the material brought to the site in the 45 haul trucks.

(45 trucks/day) x (20 tons/truck) x (0.0024 lb/ton) = 2.2 pounds per day

For unloading within the facility, this value will be negligible.

Conveyor losses:

AP-42, Section 8.19.2 lists covered conveyor losses at 0.0002 lb of PM-10 emissions per ton of material conveyed.

(45 trucks/day) x (20 tons/truck) x (0.0002 lb/ton) = 0.2 pounds per day

Fugitive losses from repository loading:

As in Section 4.5.2.2, these losses are estimated at 2.2 pounds of PM-10 dust per day. Further, as these emissions will be controlled using temporary dust covers they are considered negligible.

Fugitive losses from loading:

Truck Loading

AP-42, Section 8.19.1 lists PM-10 emissions for truck loading for sand and gravel operations as 0.0024 lb/ton loaded. Assuming that 400 tons per day go to the batch plant, the remainder will be loaded either for shipment or to go back to the bermed area.

((2,880 yd^3/day) x (2,700 lb/yd^3) / (2,000 lb/ton)) - 400 tons = 3,488 tons per day

(0.0024 lb PM-10/ton) x (3,488 tons/day) = 8.4 pounds of PM-10 per day

Assuming 50 percent control efficiency: (8.4 lb/day) x (1-0.5) = 4.2 pounds per day

Excavation Erosion

Dust will also be generated as a result of wind erosion of the open excavation. The maximum area of disturbance at any one time is anticipated at 40 acres. AP-42, Section 8.24 presents wind erosion for western states open pit coal mines as 0.38 tons of total suspended particulates per acre per year.

(40 ac/yr) x (0.38 ton/ac) x (2,000 lb/ton) x (1 yr/365 days) = 83.3 pounds per day

PM-10 emissions = (83.3 lb/day) x (0.36% PM-10) = 30.0 pounds per day

Assuming 80 percent control efficiency for that area not actively being worked (39 acres) and a 50 percent control efficiency for the acre under construction:

((30.0 lb/day) x (39/40) x (1-0.8)) + ((30.0 lb/day) x (1/40) x (1-0.5) = 6.2 pounds of PM-10 dust per day

Rock Plant Emissions

Rock plant emissions will be similar to those presented in Section 4.5.2.1 and would be expected to produce approximately 12.2 pounds of PM-10 emissions per day for a controlled facility. Stockpile erosion will also be similar to that presented in Section 4.5.2.1 and are 0.1 pound of PM-10 dust per day.

Batch Plant

The concrete batch plant will continue to operate at a rate of 50 tons per hour and expected emissions are 5.9 pounds of PM-10 per day as presented in Phase 4, above.

The total PM-10 loading for the site is the combined PM-10 for dust from erosion, construction equipment exhaust emissions, on-site truck travel and the rock and batch plants and that for on-site construction equipment. This total amount of PM-10 generated on-site is calculated as:

(199.7 lb/day for active construction) + (6.3 lb/day for wind erosion) + (12.1 lb/day for internal travel) + (12.2 lb/day for rock plant) + (5.9 lb/day for batch plant) + (12.7 lb/day for exhaust particulates) + (4.2 lb/day for batch drops) = 253.1 pounds of PM-10 per day

Miscellaneous Sources

Evaporative fuel losses:

AP-42, Section 4.5 lists transfer operations for diesel loading from tank trucks at 0.03 lb per 1,000 gallons transferred. Seven pieces of equipment are anticipated for on-site operations. As previously discussed, the average fuel consumption for heavy equipment is approximately 12 gallons per hour.

(6 pieces) x (12 gal/hr) x (8 hr/day) = 576 gallons per day

(576 gal) x (0.03 lb/1,000 gal) = 0.02 pounds per day

4.5.2.3 Subsequent Construction

Final build-out plans call for the installation of a railroad spur and a rail car bulk decontamination building. These are to be constructed in Phase 7 after the facility has been in operation for two to three years. Normal receiving operations as in Phase 6 will continue, however, excavation of the containment area will be curtailed during this 2.5 month period.

Exhaust Emissions for Off-Site Vehicle Travel

A work force of 58 will be used to staff the facility and provide the necessary labor for construction. As with the first two years of operation, about 45 trucks per day will deliver wastes to the facility. Twelve additional trucks per day are anticipated for rail construction and miscellaneous materials and water deliveries.

(58 employees + 57 trucks) x (2 ADT/vehicle) = 230 ADT

The break-down is as follows:

- 58 two-way vehicle trips for employee commuting (average 35 miles each direction).
- 45 two-way heavy truck trips for waste deliveries (average 170 miles each direction).
- 12 two-way heavy truck trip for miscellaneous deliveries (at 35 miles each way).

Auto and truck emission factors are as presented in Section 4.5.2.1, above.

Total mobile exhaust emissions per day:

Carbon monoxide - 266.8 pounds per day
Nitrogen oxides - 667.8 pounds per day
Reactive hydrocarbons - 75.0 pounds per day
Sulfur oxides - 20.0 pounds per day
PM-10 particulates - 105.7 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

Dust emissions will be as presented in Section 4.5.2.2, above. Approximately 5.7 pounds of PM-10 will be generated per day.

On-site Operations

Heavy Equipment

Fuel Usage

Fuel usage is based upon five pieces of heavy equipment operating 8 hours per day. With an average fuel consumption of 12 gallons per hour, 480 gallons per day will be used.

Exhaust Emissions

Construction is anticipated to require five pieces of heavy equipment and a water truck. Emissions factors are based upon the individual types of equipment as proposed by the applicant. These include one bull dozer, one scraper one grader and two loaders. Additionally, when the rails for the railroad are installed a special rail installation train will be utilized. This is anticipated at one week. Emission factors for this assemblage of equipment are as presented in AP-42, 1985, Table II-7.1 and are as presented below:

1 bull dozer X (8 hr/day) X (50.7 gm PM-10/hr) / (454 gm/lb) = 0.9 lb PM-10/day
1 bull dozer X (8 hr/day) X (55.06 gm HC/hr) / (454 gm/lb) = 1.0 lb HC/day
1 bull dozer X (8 hr/day) X (157.01 gm CO/hr) / (454 gm/lb) = 2.8 lb CO/day
1 bull dozer X (8 hr/day) X (570.7 gm NOx/hr) / (454 gm/lb) = 10.1 lb NOx/day
1 bull dozer X (8 hr/day) X (62.3 gm SOx/hr) / (454 gm/lb) = 1.1 lb SOx/day

1 scraper X (8 hr/day) X (184 gm PM-10/hr) / (454 gm/lb) = 3.2 lb PM-10/day
1 scraper X (8 hr/day) X (128.15 gm HC/hr) / (454 gm/lb) = 2.3 lb HC/day
1 scraper X (8 hr/day) X (568.19 gm CO/hr) / (454 gm/lb) = 10.0 lb CO/day
1 scraper X (8 hr/day) X (1,740.74 gm NOx/hr) / (454 gm/lb) = 30.7 lb NOx/day
1 scraper X (8 hr/day) X (210 gm SOx/hr) / (454 gm/lb) = 3.7 lb SOx/day

1 grader X (8 hr/day) X (27.7 gm PM-10/hr) / (454 gm/lb) = 0.5 lb PM-10/day
1 grader X (8 hr/day) X (18.07 gm HC/hr) / (454 gm/lb) = 0.3 lb HC/day
1 grader X (8 hr/day) X (68.46 gm CO/hr) / (454 gm/lb) = 1.2 lb CO/day
1 grader X (8 hr/day) X (324.43 gm NOx/hr) / (454 gm/lb) = 5.7 lb NOx/day
1 grader X (8 hr/day) X (39.0 gm SOx/hr) / (454 gm/lb) = 0.7 lb SOx/day

2 loaders X (8 hr/day) X (77.9 gm PM-10/hr) / (454 gm/lb) = 2.7 lb PM-10/day
2 loaders X (8 hr/day) X (113.17 gm HC/hr) / (454 gm/lb) = 4.0 lb HC/day
2 loaders X (8 hr/day) X (259.58 gm CO/hr) / (454 gm/lb) = 9.1 lb CO/day
2 loaders X (8 hr/day) X (858.19 gm NOx/hr) / (454 gm/lb) = 30.2 lb NOx/day
2 loaders X (8 hr/day) X (82.5 gm SOx/hr) / (454 gm/lb) = 2.9 lb SOx/day

Additionally, a water truck will be utilized to keep dust emissions under control. During the construction of the railroad spur, material will be back-hauled from the repository area to the area of active construction. Assuming that the spur line is 10 miles long, the water truck will cover an average distance of approximately 12 miles. This distance will be longer for work near Hector, but will be shorter when nearing the facility. Thus, the average travel distance is approximately 5 miles in each direction. Twice watering the active area will take another approximately 2 miles per day for a total daily trip of approximately 12 miles. Inactive areas will be treated with a dust palliative and will not require daily watering.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (12 mi/day) = 0.2 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (12 mi/day) = 0.5 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (12 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.1 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (12 mi/day) = 0.01 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (12 mi/day) = 0.1 lb/day

On a daily basis, 80 loads of aggregate removed from the bermed area will be trucked to the area of railroad construction. This distance will vary from immediately adjacent to the facility to as many as 10 miles away when working near Hector for an average one-way distance of 5 miles. These trucks will travel over the approximate 750 feet of gravel road, the 5 miles of paved road and approximately 500 feet of soil on each leg of the trip. Exhaust emissions will be generated along the length of the trip.

((5 mi/load) + (750 ft/5,280 ft/mi) + (500 ft/5,280 ft/mi)) x 2 trips = 10.5 miles per trip

(80 loads/day) x (10.5 mi/load) = 838 miles per day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (838 mi/day) = 11.1 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (838 mi/day) = 34.1 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (838 mi/day) x (0.9 lb ROG/1 lb/TOG) = 3.6 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (838 mi/day) = 1.0 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (838 mi/day) = 5.4 lb/day

Railroad Construction Exhaust

In addition to the exhaust by-products produced by heavy equipment, it is estimated that the actual installation of the rails will take an additional week. Rails are brought to the site and installed via train. A special track-laying train will be utilized. After reaching the area of construction, most of the time the engine will be in idle. This is fairly equivalent to a switch engine which spends most of its' time idling while waiting to shuffle railroad cars. Conversation with Aaron Adams, Equipment Supervisor for AT&SF, Barstow (December 3, 1990) revealed that most of the switch engines in use are turbo-charged 2-stroke diesels operating with 2,000 to 2,500 horsepower. Fuel consumption ranges from about 5 gallons per hour at idle to as much as 60 gallons per hour for a full load. AP-42 gives air pollutant emission factors for supercharged 2-stroke diesel switch engines for carbon monoxide, hydrocarbons and nitrogen oxides based upon available horsepower, fuel consumption and hours of operation. When a switch engine load-factor is factored, the fuel usage is approximately 14 to 15 gallons per hour. Based upon these data, and assuming an 8-hour working day, fuel usage is calculated as:

(15 gal/hr) x (8 hr/day) = 120 gallons per day

Emissions factors for railroad engines are based upon AP-42, 1985, Section II-2 and are:

Carbon monoxide - 84 pounds per 1,000 gallons
Nitrogen oxides - 250 pounds per 1,000 gallons
Reactive organics - 5.5 pounds per 1,000 gallons
Sulfur oxides - 57 pounds per 1,000 gallons
Particulates - 25 pounds per 1,000 gallons

Carbon monoxide = (84 lb/1,000 gal) x (120 gal/day) = 10.1 lb/day
Nitrogen oxides = (250 lb/1,000 gal) x (120 gal/day) = 30 lb/day
Reactive organics = (5.5 lb/1,000 gal) x (120 gal/day) = 0.7 lb/day
Sulfur oxides = (57 lb/1,000 gal) x (120 gal/day) = 6.8 lb/day
Particulates = (25 lb/1,000 gal) x (120 gal/day) = 3.0 lb/day

On-site Haul Truck Exhaust Emissions

As a worst case scenario, trucks may be used to transfer the residuals from the receiving facility to the repository area. These exhaust emissions are as presented in Section 4.5.2.2.

Total On-site Exhaust Emissions

The total on-site exhaust emissions per day are:

Carbon monoxide	- 44.8 pounds per day
Nitrogen oxides	- 142.4 pounds per day
Reactive hydrocarbons	- 12.1 pounds per day
Sulfur oxides	- 16.2 pounds per day
PM-10 particulates	- 16.0 pounds per day

Fugitive Dust Emissions for On-Site Vehicle Travel and Operations

Vehicle Travel

As shown in Section 4.5.2.2, if on-site haul trucks are used to move residuals from the receiving area to the repository, 0.8 pounds of PM-10 dust will be generated daily.

Additionally, these trucks will pass over gravel roads on their way to the repository. This is value is also as presented in Section 4.5.2.2 and with water control is estimated at 11.3 pounds of PM-10 dust per day.

As discussed above, the water truck is expected to drive about 12 miles per day with an anticipated truck weight of approximately 20 tons when full and 4 tons when empty for an average weight of 12 tons. These trucks will travel over paved and graveled roads and, in the construction area, dirt. These trucks typically have 10 wheels. Assuming a worst case scenario, the entire 12 miles were assumed to be over dirt. The average speed is anticipated at 5 miles per hour:

$E = 0.36(5.9)\ (9/12)\ (5/30)\ (12/3)^{0.7}\ (10/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 1.0 pounds of PM-10 per mile

(12 mi/day) x (1.0 lb/mi) = 12.0 pounds of PM-10 per day

Assuming that the water can reduce dust lofting by 50 percent:

(12 lb/day) x (1-0.5) = 6.0 pounds of PM-10 per day

Railroad Installation

The construction of the railroad spur is anticipated to take 2.5 months. The area to be disturbed is approximated at 10 feet wide for 8 miles but may be as wide as 50 feet for 2 miles, for an average width of disturbance of 18 feet.

(18 ft) x (10 mi) x (5,280 ft/mi) x (1 ac/43,560 ft) = 21.8 acres

AP-42 predicts fugitive dust from civil construction at 1.2 tons per acre per month of activity based upon a 30 percent silt content (AP-42, 1988, Section 11.2.4). On-site sieve analysis determined the surface soil to contain an average of about 9 percent silt.

(21.8 ac/2.5 mo) x (1.2 tons/ac/mo) = 10.5 tons per month
(10.5 tons/mo) x (1 mo/30 days) x (2,000 lb/ton) = 698 pounds per day

Assuming 50 percent control efficiency: (698 lb/day) x (1-0.5) = 349 pounds per day

PM-10 dust comprises approximately 45 percent of the silt (AP-42, Section 11.2.1)

(349 lb/day) x (9%/30%) x (0.45%) = 47.1 pounds of PM-10 per day

Ballast will be hauled from the repository area to the area of active construction. These hauls are averaged at 750 feet over gravel, 5 miles of industrial paved roads and 500 feet of soil in each direction. As shown in Sections 4.5.2.1 and 4.5.2.2, haul truck travel over the soil, gravel and paved roads generates 8.0, 4.4 and 0.9 pounds of dust per mile traveled, respectively. Both the values presented for gravel and soil are for PM-10 material, whereas the travel over the paved surface must be multiplied by 45 percent for PM-10 emissions. Water control is expected to attain a control efficiency of 80 percent over the paved and gravel roads and 50 percent over the soil. Truck travel is anticipated at an average of 1,500 feet over gravel, 10 miles over paved road and 1,000 feet over soil for both ends of the trip. The total amount of dust generated from truck travel is then calculated at:

(80 trucks) x ((1,500 ft/5,280 ft/mi x 4.4 lb/mi) x (1-0.8) + (10 mi x 0.9 lb/mi) x (1-0.8) x (45%) + (1,000 ft/5,280 ft/mi x 8.0 lb/mi) x (1-0.5) = 165.5 pounds of PM-10 dust per day

The 80 trucks that are to deliver the aggregate to the railroad construction are will need to be loaded and unloaded. Assuming that each truck can transport 20 tons per load, 1,600 tons will be transported on a daily basis during railroad construction. Batch drops generate 0.0024 pounds of PM-10 dust per ton loaded. Assuming that the 1,600 tons is dropped twice (once onto the trucks and once from the trucks and water control can attain a 50 percent control efficiency:

(1,600 tons/day) x (0.0024 lb/ton) x (2 loads per day) x (1-0.5) = 3.8 pounds of PM-10 dust per day

Other On-site Operations

Batch drops:

AP-42, Section 8.19.1 lists batch drops from truck unloading generate 0.0024 lb of PM-10 emissions per ton unloaded.

(45 trucks/day) x (20 tons/truck) x (0.0024 lb/ton) = 2.2 pounds per day

For unloading within the facility this value will be negligible.

Conveyor losses:

AP-42, Section 8.19.2 lists covered conveyor losses at 0.0002 pounds of PM-10 emissions per ton of material conveyed.

(45 trucks/day) x (20 tons/truck) x (0.0002 lb/ton) = 0.2 pounds per day

Fugitive losses from repository loading:

As in Section 4.5.2.2., these emissions are estimated at 2.2 pounds of PM-10 dust per day. Further, as the dumping operations into both the silos and the trapezoids will be controlled using temporary dust covers, these emissions are considered negligible.

Fugitive losses from excavation:

During this phase, excavation operations will cease. Thus the only losses from the excavation area will be that due to erosion and truck loading to provide ballast material.

Scraper Loading

An estimated 32 loads per day will be removed from the area of the excavation over both 750 feet of soil and gravel. The scraper can move approximately 30 cubic yards per load or about 40 tons. Thus, 1,280 tons will be moved on a daily basis.

Total suspended particulate losses for topsoil removal utilizing scrapers are presented as 0.058 lb of PM-30 dust per ton of material excavated. AP-42, Section 11.2.1 shows that PM-10 dust is 0.36/0.80 or 45 percent of PM-30 dust. Control efficiency is estimated at 50 percent.

(1,280 tons/day) x (0.058 lb/ton) x (45% PM-10/PM-30) x (1-0.5) = 16.7 pounds of PM-10 dust per day

Scraper Travel

Travel on the unpaved working area will raise dust. It is estimated that 32 loads per day will be removed from the bermed area around the open pit. The entrance to the area will be covered with gravel while the perimeter will be dirt. The equipment is to carry the soil from the active area to the berm and will drive over approximately 750 feet of gravel and 750 feet of dirt for a total trip of 3,000 feet per load.

As shown in Phase 4, above, scrapers generate 1.5 and 0.7 pounds of PM-10 dust per mile for travel over dirt and gravel, respectively. Assuming that water control can reduce dust lofting by 50 percent over dirt and 80 percent over gravel:

(32 loads) x ((1,500 ft/load) x (1 mi/5,280 ft) x (1.5 lb/mi) x (1-0.5) + (1,500 ft/load) x (1 mi/5,280 ft) x (0.7 lb/mi) x (1-0.8) = 8.1 pounds of PM-10 dust per day

Scraper Unloading

AP-42, Section 8.24.4 estimates that drops from scrapers generate 0.04 pounds of PM-30 dust per ton unloaded. AP-42, Section 11.2.1 shows that PM-10 dust is 0.36/0.80 or 45 percent of PM-30 dust. Assuming that water control can reduce dust emissions by 50 percent:

(1,280 tons/day) x (0.04 lb of PM-30/ton) x (0.45% PM-10/PM-30) x (1-0.5) = 11.5 pounds of PM-10 per day

Excavation Erosion

Dust will also be generated as a result of wind erosion of the open excavation. The maximum area of disturbance at any one time is anticipated at 40 acres. As shown in Section 4.5.2.2 above, this value is estimated at 6.2 pounds per day.

Rock Plant Emissions

Rock plant emissions will be similar to those presented in Section 4.5.2.1 and would be expected to produce approximately 12.2 pounds of PM-10 emissions per day for a controlled facility. Stockpile erosion will also be similar to that presented in Section 4.5.2.1 and are 0.1 pound of PM-10 dust per day.

Batch Plant

The concrete batch plant will continue to operate at a rate of 50 tons per hour and expected emissions are 5.9 pounds of PM-10 per day as presented in Phase 4, above.

The total PM-10 loading for the site is the combined PM-10 for dust from erosion, construction equipment exhaust emissions, on-site truck travel and the rock and batch plants and that for on-site construction equipment. This total amount of PM-10 generated on-site is calculated as:

(80.0 lb/day for active construction) + (6.3 lb/day for wind erosion) + (144.5 lb/day for internal travel) + (12.2 lb/day for rock plant) + (5.9 lb/day for batch plant) + (16.0 lb/day for exhaust emissions) + (3.8 lb/day for batch drops) = 268.7 pounds of PM-10 per day

Miscellaneous Sources

Evaporative fuel losses:

AP-42, Section 4.5 lists transfer operations for diesel loading from tank trucks at 0.03 lb per 1,000 gallons transferred. Six pieces of equipment are anticipated for on-site operations. As previously discussed, the average fuel consumption for heavy equipment is approximately 12 gallons per hour.

(5 pieces) x (12 gal/hr) x (8 hr/day) = 480 gallons per day

(480 gal) x (0.03 lb/1,000 gal) = 0.01 pounds per day

4.5.2.4 Subsequent Operations

During subsequent operations (Phase 8), the railroad will be operational and the facility will receive up to 30 railcars of residuals per day. Additionally, up to 25 trucks per day will deliver residual materials for disposal. Railcars would be dropped at the Hector siding by passing trains. Therefore, no significant additional emissions for rail service would be produced. However, a dedicated Trackmobile would be used to shuttle the railcars to the site; a distance of about 10 miles in each direction.

EXHAUST EMISSIONS FOR VEHICLE TRAVEL AND HEAVY EQUIPMENT OPERATIONS

Vehicle Travel

ADT for Vehicle Travel

The rock and batch plants would be used for the on-site construction of the waste storage silos and off-site export of rock. This export would utilize trucks and/or rail cars which had brought in waste materials. Thus, few if any additional trips would be generated from the operations of the rock and batch plants.

Upon operation of the rail spur, truck traffic would decrease from 45 to 25 trucks per day. The daily ADT is based on the following:

- 58 two-way vehicle trips for employee commuting (average 35 miles each direction).
- 25 two-way heavy truck trips for waste deliveries (average 170 miles each direction).
- 12 two-way heavy truck trips for miscellaneous deliveries (average 35 miles each direction).

Auto, bus and truck emissions are as presented in Section 4.5.2.1, above.

For employees:

Worker commute exhaust emissions are based upon 48 employees traveling an average round trip distance of 50 miles, 10 employees traveling a round trip distance of 70 miles and one bus averaging 20 miles a day to shuttle employees from Hector to the site. Calculations are as presented in Section 4.5.2.2.

For truck emissions:

Daily material hauls are based upon the following:
25 loads of residuals
12 loads for cement, building materials, and water

Exhaust emissions are based upon 12 trucks at 70 miles per round trip for cement, building materials and water and 25 trucks at an anticipated 170 miles in each direction for a daily total of 9,340 miles per day.

Carbon monoxide	-	(5.99 gm/mi) x (1 lb/454 gm) x (9,340 mi/day) = 123.2 lb/day
Nitrogen oxides	-	(18.46 gm/mi) x (1 lb/454 gm) x (9,340 mi/day) = 379.8 lb/day
Reactive organics	-	(2.14 gm/mi) x (1 lb/454 gm) x (9,340 mi/day) x (0.9 lb ROG/1 lb/TOG) = 39.6 lb/day
Sulfur oxides	-	(0.55 gm/mi) x (1 lb/454 gm) x (9,340 mi/day) = 11.3 lb/day
Particulates	-	(2.92 gm/mi) x (1 lb/454 gm) x (9,340 mi/day) = 60.1 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide	- 177.0 pounds per day
Nitrogen oxides	- 391.3 pounds per day
Reactive hydrocarbons	- 46.1 pounds per day
Sulfur oxides	- 11.7 pounds per day
PM-10 particulates	- 62.0 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

As shown in Section 4.5.2.2. Trucks, autos, and the bus are expected to generated 1.1, 0.1 and 0.8 pounds of dust per mile, respectively. For haul trucks and automobiles traveling along the site access road from Hector, the calculated emission factor uses the following values:

(37 trucks/day) x (2 trips/truck) x (10 mi/trip) = 740 miles per day

(740 miles/day) x (1.011 lb/mi) = 8.1 pounds per day

For autos:

(58 autos/day) x (2 trips/auto) x (10 mi/trip) = 1,160 miles per day

(1,160 miles/day) x (0.001 lb/mi) = 1.2 pounds per day

Total dust generated along the access corridor:

(8.1 lb + 1.2 lb) x (0.45% PM-10/PM-30) = 4.2 pounds of PM-10 per day

The applicant will use water flushing to keep the dust down along the access corridor. AP-42 places an efficiency of 50 percent for twice weekly wet sweeping. Assuming daily flushing can achieve an efficiency of at least 80 percent:

(304 lb/day) x (1-0.8) = 61.2 pounds per day

On-site Operations

Heavy Equipment

Fuel Usage

Based upon six pieces of heavy equipment working 8 hours per day, for an average fuel consumption of 12 gallons per hour, 576 gallons will be used on a daily basis.

Exhaust Emissions

Construction is anticipated to require six pieces of heavy equipment and a water truck. Emissions factors are based upon the individual types of equipment as proposed by the applicant. These include one bull dozer, three scrapers, one grader and one loader. This is the same assemblage of equipment as is used in Phase 6 and exhaust emissions for heavy equipment operations are expected to be similar to those produced in Phase 6.

Received material will be screened in the laboratory before being trucked to the receiving structure. From here the sorted materials will be transferred to the containment area by covered conveyor, rail or truck. A worst case scenario assumes that all of the material is transferred on-site by truck. The number of trucks would be equal to the number of trucks bringing wastes to the facility (i.e., 25) plus those loads from the railroad. As a worst case scenario, it is assumed that the entire 1,800 tons per day will travel from the receiving facility to the repository area. Therefore, a total of 90 trucks will transport the sorted materials a distance of approximately 1,500 feet. A return trip brings this trip up to 3,000 feet for a total of about 51 miles for the 90 loads.

Carbon monoxide	-	(5.99 gm/mi) x (1 lb/454 gm) x (51 mi/day) = 0.7 lb/day
Nitrogen oxides	-	(18.46 gm/mi) x (1 lb/454 gm) x (51 mi/day) = 2.1 lb/day
Reactive organics	-	(2.14 gm/mi) x (1 lb/454 gm) x (51 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.2 lb/day
Sulfur oxides	-	(0.55 gm/mi) x (1 lb/454 gm) x (51 mi/day) = 0.1 lb/day
Particulates	-	(2.92 gm/mi) x (1 lb/454 gm) x (26 mi/day) = 0.3 lb/day

Railroad Operations

Additionally, emissions will be produced by the railroad operations which brings waste materials to the site. In accordance with the SBAQMD, these emissions are not considered mobile and are a part of the proposed project. The Applicant proposes to use existing trains which travel along I-40 to bring wastes to a receiving station located in Hector. Thus, no dedicated train (except that from Hector to the site) will be utilized and the emissions associated with the transport of materials to Hector is considered negligible. From Hector the railcars will be removed from the train and shuttled to the site, a distance of about 10 miles, using mobile railcar movers. The unit of choice is the Trackmobile Mobile Railcar Mover. Conversation with Frank Matasavage, Marketing Coordinator with Trackmobile (Personal communication, May 22, 1991) revealed that their units are typically 2-stroke supercharged diesel. Horsepower ratings run from 108 to as mush as 400. Based upon the number of cars to be moved, the engine of choice would be the 4,500 TM which weighs 42,000 pounds and uses a 6-cylinder supercharged Detroit Diesel engine rated at 180 horsepower. In this analysis, each one-way rail trip from Hector to the site is estimated at 10 miles with a trip duration of approximately 1.25 hour. A worst case analysis assumes that 30 railcars are dropped at the Hector siding for delivery to the facility. These 30 cars would each be loaded with the 1,300 tons of residuals not brought in by the 25 haul trucks. Thus each railcar would contain 43.3 tons of residual materials. The calculations for the number of cars which can be hauled at one time is as follows:

Assume a maximum grade of 2 percent
Assume a maximum turn radius of 4 percent
Assume the average tare weight of a railcar is 20 tons
The weight of the 4,500 TM is 21 tons

Machine weight:	42,000 lb
Weight transfer for first coupler from loaded car (50%):	63,300 lb
Weight transfer for second coupler from loaded car (50%):	63,300 lb
Total weight on Drive wheels:	168,600 lb
Frictional efficiency	x 0.33
Tractive effort (T.E.):	55,638 lb

Basic friction:		10 lb/ton
Grade (2%) (each % adds 20 lb):		40 lb/ton
Curve (3°) (each ° adds 1 lb for short cars)	+	3 lb/ton
Total resistance per ton:		53 lb/ton
Weight of railcars:	x	63.3 tons
Tractive effort per car:		3,355 T.E./car

55,638 T.E./ 3,355 T.E./car = 16.6 cars moved

Thus, the railcars would take at least two round trip loads.

If we assume that the Trackmobile produces emissions similar to that of a 2-stroke supercharged diesel switch engine, then emissions can be calculated based upon horsepower and hours of operation.

AP-42, Section 11-2 presents emission factors for rail operations. The work output is based upon the load factor, the available horsepower and the hours of operation. If we assume two round trips per day at 1.5 hours per leg (includes adding and subtracting railcars), then the total number of hours is 6. To pull the full string of cars we

will assume that the engine puts out its full rated 180 horsepower. The work output is then 1,080 horsepower hours. Emission factors for 2-stroke supercharged switch engines are as follows:

Carbon monoxide: 3.9 gm/hphr
Hydrocarbons: 8.9 gm/hphr
Nitrogen oxides: 11.0 gm/hphr

Thus, the calculated emissions are as follows:

Carbon monoxide: (1,080 hphr) x (3.9 gm/hphr) / (454 gm/lb) = 9.3 pounds
Exhaust hydrocarbons: (1,080 hphr) x (8.9 gm/hphr) / (454 gm/lb) = 21.3 pounds
Nitrogen oxides: (1,080 hphr) x (11.0 gm/hphr) / (454 gm/lb) = 26.2 pounds

Additionally, sulfur oxides and particulate matter were back-calculated from emissions for composite average locomotive statistics as these pollutant species are not presented by engine type. As shown above carbon monoxide emissions are presented as 3.9 gm/hphr. In accordance with AP-42, it is also based on 84 lb/1,000 gallons of fuel burned. Thus:

(3.9 gm/hphr) / (454 gm/lb) = 0.0086 lb/hphr

(0.0086 lb/hphr) x (1,080 hphr) = 9.3 pounds per day

(9.3 lb/day) / (84 lb/1,000 gal) = 111 gallons per day

Emissions factors for average locomotives are based upon AP-42, 1985, Section II-2 and are:

Sulfur oxides - 57 lb/1,000 gal
Particulates - 25 lb/1,000 gal

Therefore:

Reactive organics = (5.5 lb/1,000 gal) x (111 gal/day) = 0.6 pounds per day
Sulfur oxides = (57 lb/1,000 gal) x (111 gal/day) = 6.3 pounds per day
Particulates = (25 lb/1,000 gal) x (111 gal/day) = 2.8 pounds per day

The total on-site exhaust emissions (including the railcar mover) per day are:

Carbon monoxide - 48.7 pounds per day
Nitrogen oxides - 151.5 pounds per day
Reactive hydrocarbons - 32.2 pounds per day
Sulfur oxides - 20.8 pounds per day
PM-10 particulates - 15.6 pounds per day

Fugitive Dust Emissions for On-Site Vehicle Travel and Operations

Vehicle Travel

Dust will be generated along the interior access road which extends from the receiving building to the repository site, a distance of about 1,500 feet. Approximately half of this travel will be over paved road while the other half will be over maintained gravel roads. The number of trucks would be equal to the amount of residuals received divided by 20 tons per truck (i.e., 90 trucks per day). As mentioned, these trucks will transport the sorted materials a distance of approximately 1,500 feet. A return trip brings this trip up to 3,000 feet for a total of about 51 miles for the 90 loads.

Haul trucks received at the facility will unload within an enclosed building. Emissions will be controlled via forced air and baghouse so external emissions will be insignificant. The materials will be transported to the silos via an enclosed conveyor system. Further, shrouds will be utilized at the silos (and trapezoids) to abate the release of dust during loading. In lieu of this system, on-site haul trucks may be used. For the purposes of this analysis haul trucks are considered to carry 20 tons as do the internal on-site haul trucks. Additionally, both are assumed to have similar emission factors. As shown in Section 4.5.2.2, these internal haul trucks generate 0.9 pounds of dust per mile.

(90 trucks/day) x (2 trips/truck) x (750 ft/trip) x (1 mi/5,280 ft) = 25.6 miles/day

(25.6 miles/day) x (0.9 lb/mi) x (36%) = 8.3 pounds of PM-10 dust per day

Daily flushing of the paved road should attain an efficiency of at least 80 percent.

(8.3 lb/day) x (1-0.8) = 1.7 pounds of PM-10 dust per day

Additionally, these trucks will pass over gravel roads on their way to the repository. As in Section 4.5.2.2, this value is estimated at 4.4 pounds of PM-10 per mile.

(90 trucks/day) x (2 trips/truck) x (750 ft/trip) x (1 mi/5,280 ft) = 25.6 miles/day

(25.6 miles/day) x (4.4 lb/mi) = 112.6 pounds of PM-10 dust per day

Daily watering of the gravel road should attain an efficiency of at least 80 percent.

(112.6 lb/day) x (1-0.8) = 22.5 pounds per day

Other On-site Operations

Active Construction:

Excavation of the repository will recommence using the same assemblage of equipment as proposed in Section 4.5.2.2. PM-10 dust emissions (including those produced by the water truck) are also expected to be similar to those presented in that section and are estimated at 199.7 pounds of PM-10 dust per day.

Batch drops:

AP-42, Section 8.19.1 lists batch drops from truck unloading generate 0.0024 lb of PM-10 emissions per ton unloaded.

(90 trucks/day) x (20 tons/truck) x (0.0024 lb/ton) = 4.3 pounds per day

For unloading within the receiving facility this value will be negligible.

Conveyor losses:

AP-42, Section 8.19.2 lists covered conveyor losses at 0.0002 lb of PM-10 emissions per ton of material conveyed.

(1,800 tons/day) x (0.0002 lb/ton) = 0.4 pounds per day

Fugitive losses from repository loading:

Another possible source of fugitive dust generation has to do with the operation of placing the residual material into the silos or trapezoids. Though no emission factors are presented for such an operation, AP-42, Section 8.19.1 lists emission factors for bulk loading for sand and gravel processing plants. The emission factor for a batch drop (assuming 1.5 percent or greater moisture content) is listed as 0.0024 lb of PM-10 dust for each ton of material transferred. If we assume that 90 loads per day of 20 tons (1,800 total tons per day) are loaded into the silos and trapezoid, then the expected fugitive emissions are calculated as:

(1,800 tons/day) x (0.0024 lb/ton) = 4.3 pounds per day

In actuality, the PM-10 value will depend upon the content of fines in the material which will vary with the origin of the load. Additionally, for deposit into the silos, expected losses are less as the opening to the silos (and potential to lose fugitive dust) are considerably smaller than the gratings used in the dumping from sand and gravel trucks and as the silos are deeper than the sand and gravel drop, more dust will settle out before reaching the opening and becoming airborne. Further, the dumping operations into both the silos and the trapezoids will be controlled using temporary dust covers. These emissions are therefore considered negligible.

Fugitive losses from excavation:

The same assemblage of heavy equipment will be used as was used in Phase 6 and all related dust emissions are also expected to remain similar, i.e., 199.7 pounds of PM-10 dust per day (including the water truck). Further, as the size of the excavation and the active area will also be similar to Phase 6, excavation erosion is expected to remain approximately 6.2 pounds of PM-10 dust per day.

Miscellaneous Sources

Evaporative fuel losses:

Based upon 0.03 pounds per 1,000 gallons transferred, vapor emissions for the six pieces of equipment are calculated at 0.01 pounds per day.

Rock Plant Emissions

HVR excavation is estimated at 675,000 cubic yards per year, or based on a five day work-week, 2,700 cubic yards per day. Of this volume, the rock plant will continue to process approximately 400 tons per day for on-site use.

Once the rock reaches the plant, subsequent dust emissions result from crushing, screening, truck loading and unloading, conveyors and from exposed piles of aggregate. Emissions for each of these operations is presented below:

Crushing

AP-42, Section 8.19.2 lists PM-10 emissions from stone crushing operations as 0.017 lb/ton processed. Stone to be crushed is based on the needs of the facility and is 400 tons per day.

(400 tons/day) x (0.017 lb PM-10/ton) = 6.8 pounds of PM-10 dust per day

Screening

AP-42, Section 8.19.1 lists PM-10 emissions from screening operations as 0.12 lb/ton processed. As 400 tons are to be used on-site and 1,800 tons are to be transported back to L.A., 2,200 tons are to be processed per day. In actuality, some 25 percent more must be processes due to material loss to fines which cannot be utilized and will go to backfill. Thus, the full 2,700 tons will be screened on a daily basis:

(2,700 tons/day) x (0.12 lb PM-10/ton) = 324.0 pounds of PM-10 dust per day

Loading

AP-42, Section 8.19.1 lists PM-10 emissions from loading operations as 0.0024 lb PM-10/ton processed.

(2,700 tons/day - 400 tons/day) x (0.0024 lb/ton) = 5.5 pounds of PM-10 dust per day

Control Efficiency

Based upon the anticipated throughput, uncontrolled PM-10 emissions are calculated at approximately 343.4 lb per day. Wet processing can reduce emissions by 70 to 95 percent (AP-42, 1985). Thus, assuming an average control efficiency of 82.5 percent:

(6.8 lb/day + 324.0 lb/day + 5.5 lb/day) x (1-0.825) = 58.9 pounds per day

Thus, for an average, a controlled facility would be expected to produce approximately 59.0 pounds of PM-10 emissions per day.

Batch Plant

The concrete batch plant will continue to operate at a rate of 50 tons per hour and expected emissions are as presented in Phase 4, above and are 5.9 pounds of PM-10 per day.

Stockpile Erosion

AP-42, Section 8.19.1 lists PM-10 emissions from stockpile erosion as 6.3 lb/acre/day for active stockpiles and 1.7 lb/acre/day for inactive piles. As a worst case, all stockpiles will be considered as active.

As material will either be loaded for shipment, directed to the batch plant or back-hauled to the berm area, little stockpiling will be necessary. Therefore the amount of material to be stockpiled should not significantly exceed daily production. In this analysis three types of stockpiles are addressed. These are 1) material to be exported (1,800 tons/day), 2) material to be used for concrete (400 tons/day), and 3) fines for back-haul to ultimately be used for revegetation (500 tons/day). If we assume that for ease of handling and spreading that the stockpiles are no more than 10 feet high, the volume and area of each pile is as presented below:

(1,800 tons) x (2,000 lb/ton) / (100 lb/ft^3) = 36,000 cubic feet

If the side walls were vertical the area is as below:

pi r^2 h = 36,000 cubic feet

r = 33.9 feet

Thus, the 1,800 ton stockpile would have a diameter of about 68 feet if the walls were vertical. However, the walls will fall to the angle of repose which is about a 1:1 slope. Thus, the circle would be 78 feet in diameter if it were all in one pile.

(pi x 39 ft^2) / (43,560 ft^2/ac) = 0.1 acre

For the material to go to the batch plant

(400 tons) x (2,000 lb/ton) / (100 lb/ft^3) = 8,000 cubic feet

pi r^2 h = 8,000 cubic feet

r = 16.0 feet

Thus, the 400 ton stockpile would have a diameter of about 32 feet if the walls were vertical. However, the walls will fall to the angle of repose which is about a 1:1 slope. Thus, the circle would be 42 feet in diameter if it were all in one pile.

(pi x 21 ft^2) / (43,560 ft^2/ac) = 0.03 acre

For the back-haul to the repository:

(500 tons) x (2,000 lb/ton) / (100 lb/ft^3) = 10,000 cubic feet

pi r^2 h = 10,000 cubic feet

r = 17.8 feet

Thus, the 500 ton stockpile would have a diameter of about 36 feet if the walls were vertical. However, the walls will fall to the angle of repose which is about a 1:1 slope. Thus, the circle would be 46 feet in diameter if it were all in one pile.

(pi x 23 ft^2) / (43,560 ft^2/ac) = 0.04 acre

Therefore, approximately 0.2 acres of stockpiled material are expected.

(6.3 lb/ac/day) x (0.2 ac) = 1.3 pounds of PM-10 dust per day

AP-42 shows that watering has a dust efficiency of 80 percent

(1.3 lb/day) x (1-0.8) = 0.3 pounds of PM-10 dust per day

The total PM-10 loading for the site is the combined PM-10 for dust from erosion, construction equipment exhaust emissions, on-site truck travel and the rock and batch plants and that for on-site construction equipment. This total amount of PM-10 generated on-site is calculated as:

(199.7 lb/day for active construction) + (6.5 lb/day for wind erosion) + (24.2 lb/day for internal travel) + (58.9 lb/day for rock plant) + (5.9 lb/day for batch plant) + (15.6 lb/day for heavy equipment exhaust emission) + (2.8 lb/day for Trackmobile exhaust) = 313.6 pounds per day.

4.5.3 Reduced Facility Size Alternative

All emissions for initial construction are as presented for the proposed project.

4.5.3.1 Initial Operations

Exhaust Emissions for Vehicle Travel and Heavy Equipment Operations

Vehicle Travel

ADT for Vehicle Travel

Upon project completion, a reduced work force of 35 will be used to staff the facility. For the first two years of operation about 23 trucks per day will deliver wastes to the facility. An additional six trucks per day are anticipated for silo construction, miscellaneous materials and water. Including employee commutes, the total average daily traffic volume (ADT) is 128. The break-down is as follows:

23 two-way heavy truck trips for waste deliveries (average 170 miles each direction).

6 two-way heavy truck trips for miscellaneous deliveries (average 35 miles each direction).

25 two-way vehicle trips for employee commuting (average 25 miles each direction).

10 two-way vehicle trips for employee commuting (average 35 miles each direction).

1 two-way shuttle bus trip along the access corridor for employee commuting (average 10 miles each direction).

For employees:

(25 autos) x (2 trips/auto) x (35 mi/trip) + (10 autos) x (2 trips/auto) x (35 mi/trip) = 1,950 miles/day

Carbon monoxide - (6.02 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 25.9 lb/day
Nitrogen oxides - (1.29 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 5.5 lb/day
Reactive organics - (0.81 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) x (0.9 lb ROG/1 lb/TOG) = 3.1 lb/day
Sulfur oxides - (0.05 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 0.2 lb/day
Particulates - (0.215 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 0.9 lb/day

For bus emissions:

Bus emissions are calculated in accordance with AP-42, Table N-1, Diesel Powered Transit Bus Emission Factors. The bus is estimated to travel a distance of 20 miles per day.

Carbon monoxide - (51.9 gm/mi) x (20 mi) x (1 lb/454 gm) = 2.3 lb/day
Nitrogen oxides - (26.1 gm/mi) x (20 mi) x (1 lb/454 gm) = 1.1 lb/day
Hydrocarbons - (3.35 gm/mi) x (20 mi) x (1 lb/454 gm) = 0.1 lb/day
Particulates - (5.52 gm/mi) x (20 mi) x (1 lb/454 gm) = 0.2 lb/day
Sulfur oxides - (No values are presented for SOx emissions)

For trucks:

((24 trucks) x (2 trips/truck) x (170 mi/trip)) + ((6 truck) x (2 trips/truck) x (35 mi/trip)) = 8,580 miles/day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (8,580 mi/day) = 113.2 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (8,580 mi/day) = 348.9 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (8,580 mi/day) x (0.9 lb ROG/1 lb/TOG) = 36.4 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (8,580 mi/day) = 10.4 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (8,580 mi/day) = 55.2 lb/day

The total off-site mobile exhaust emissions per day are:

Carbon monoxide - 141.4 pounds per day
Nitrogen oxides - 355.5 pounds per day
Reactive hydrocarbons - 39.6 pounds per day
Sulfur oxides - 10.6 pounds per day
PM-10 particulates - 56.3 pounds per day

On-site Operations

On-site operations are to be half that of the proposed project and as heavy equipment operations are based upon a production of half that of the proposed project these emissions are expected to roughly be half of those presented in section 4.5.2.2.

Additionally, the water truck will cover roughly half of the 3.4 miles per day predicted for the proposed action. Including on-site paved road watering, the distance traveled is about 2 miles per day during on-site watering operations. Emissions are based on heavy truck emission factors as presented above.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (2.0 mi/day) = 0.03 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (2.0 mi/day) = 0.1 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (2.0 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.01 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (2.0 mi/day) = 0.002 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (2.0 mi/day) = 0.01 lb/day

Additionally, 23 two-way on-site hauls to repositories for waste disposal and earth removal (in lieu of conveyor system, 1,500 feet in each direction).

(23 hauls) x (2 trips/haul) x (1,500 ft/trip) / (5,280 ft/mi) = 13.1 miles/day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (13.1 mi/day) = 0.2 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (13.1 mi/day) = 0.5 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (13.1 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.1 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (13.1 mi/day) = 0.02 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (13.1 mi/day) = 0.1 lb/day

The total on-site exhaust emissions per day are:

Carbon monoxide - 19.5 pounds per day
Nitrogen oxides - 62.0 pounds per day
Reactive hydrocarbons - 5.2 pounds per day
Sulfur oxides - 7.2 pounds per day
PM-10 particulates - 6.4 pounds per day

Fugitive Dust Emissions for Vehicle Travel and On-Site Operations

Vehicle Travel

As with the proposed project, dust which is "kicked-up" by the tires of haul trucks, employee traffic and the bus is 1.1, 0.1 and 0.8 pounds per mile, respectively.

For trucks:

E = 1.1 lb/mile

(29 trucks/day) x (2 trips/truck) x (10 mi/trip) = 580 miles/day

(580 miles) x (1.1 lb/mi) = 638 lb/day

For autos:

E = 0.1 lb/mile

(10 autos/day) x (2 trips/auto) x (10 mi/trip) = 200 miles/day

(200 miles) x (0.1 lb/mi) = 20 lb/day

For the bus:

E = 0.8 lb/mile

(1 bus/day) x (2 trips/bus) x (10 mi/trip) = 20 miles/day

(20 miles) x (0.8 lb/mi) = 8 lb/day

Assuming that regular watering of the road can attain a control efficiency of 80 percent:

(638 lb/day + 20 lb/day + 8 lb/day) x (0.36% PM-10) x (1-0.8) = 48.0 lb/day

On-site Emissions

In the proposed action, Section 4.5.2.2., on-site operation were calculated to generate a total of 253.1 pounds of PM-10 dust on a daily basis. Assuming half the production (and half of the on-site heavy equipment, rock and batch plant, and haul activity), fugitive PM-10 dust emissions will be roughly half of the 253.1 pounds or about 126.6 pounds per day.

Miscellaneous Sources

Evaporative Fuel Losses

Section 4.5.2.2 lists transfer operations for diesel loading from tank trucks at 0.03 lb per 1,000 gallons transferred for a total of 0.02 pounds per day. Assuming a level of activity of half that for the proposed action, expected evaporative losses are calculated at 0.01 pounds per day.

4.5.3.2 Subsequent Construction

Exhaust Emissions for Construction and Simultaneous Operations

As with the proposed project, final build-out plans call for the installation of the railroad spur after the facility has been in operation for 2 to 3 years. If we assume the same build-out schedule for the railroad, the emissions for this period will be the emissions as presented for subsequent construction presented in Section 4.5.2.3, above less half of the on-site hauls to transfer residuals to the repository area (due to half the production schedule). The total on-site exhaust emissions for the subsequent construction from Section 4.5.2.3 are as below:

Carbon monoxide	- 44.8 pounds per day
Nitrogen oxides	- 142.4 pounds per day
Reactive hydrocarbons	- 12.1 pounds per day
Sulfur oxides	- 16.2 pounds per day
PM-10 particulates	- 16.0 pounds per day

Subtracting the 22 on-site haul trips for the reduced operations, the total on-site exhaust emissions are calculated as:

Carbon monoxide	- 44.6 pounds per day
Nitrogen oxides	- 141.9 pounds per day
Reactive hydrocarbons	- 12.0 pounds per day
Sulfur oxides	- 16.2 pounds per day
PM-10 particulates	- 15.9 pounds per day

Off-site exhaust emissions are those presented for initial operations in Section 4.5.3.2, above.

Fugitive Dust Emissions for Construction and Simultaneous Operations

Fugitive dust raised along the access corridor will be as presented for the initial operations in Section 4.5.3.2, above. This value is 48.0 pounds per day.

Fugitive dust emissions for this period will be those emissions as presented for the construction of the railroad in Section 4.5.2.3 in addition to the initial operations dust as presented in Section 4.5.3.3, above. The amount of PM-10 material generated in the construction of the railroad was 173.9 pounds per day. An additional 15.9 pounds of exhaust particulate matter will be generated for all on-site operations for a total PM-10 loading of 189.8 pounds per day.

4.5.3.3 Subsequent Operations

Exhaust Emissions for Construction and Simultaneous Operations

The rock and batch plants would be used for the on-site construction of the waste storage silos and off-site export of rock and concrete. This export would utilize trucks and/or rail cars which had brought in waste materials. Thus, few if any additional trips would be generated from the operations of the rock and batch plants. As with the acceptance of waste materials, the quantities processed will be half of the proposed action.

Vehicle Travel

ADT for Vehicle Travel

Upon operation of the rail spur, truck traffic would decrease from 29 to 18 trucks per day (including miscellaneous deliveries). Assuming a similar work force as with initial operations will yield a total fully operational ADT of approximately 118 including miscellaneous materials deliveries. The break-down is as follows:

12 two-way heavy truck trips for waste deliveries (average 170 miles each direction).

6 two-way heavy truck trips for miscellaneous deliveries (average 35 miles each direction).

25 two-way vehicle trips for employee commuting (average 25 miles each direction).

10 two-way vehicle trips for employee commuting (average 35 miles each direction).

1 two-way shuttle bus trip along the access corridor for employee commuting (average 10 miles each direction).

For autos:

((25 autos/day) x (2 trips/auto) x (25 mi/trip)) + ((10 autos/day) x (2 trips/auto) x (35 mi/trip)) = 1,950 mi/day

Carbon monoxide - (6.02 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 25.9 lb/day
Nitrogen oxides - (1.29 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 5.5 lb/day
Reactive organics - (0.81 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) x (0.9 lb ROG/1 lb/TOG) = 3.1 lb/day
Sulfur oxides - (0.05 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 0.2 lb/day
Particulates - (0.215 gm/mi) x (1 lb/454 gm) x (1,950 mi/day) = 0.9 lb/day

For bus emissions:

Bus emissions are calculated in accordance with AP-42, Table N-1, Diesel Powered Transit Bus Emission Factors. The bus is estimated to travel a distance of 20 miles per day.

Carbon monoxide - (51.9 gm/mi) x (20 mi) x (1 lb/454 gm) = 2.3 lb/day
Nitrogen oxides - (26.1 gm/mi) x (20 mi) x (1 lb/454 gm) = 1.1 lb/day
Hydrocarbons - (3.35 gm/mi) x (20 mi) x (1 lb/454 gm) = 0.1 lb/day
Particulates - (5.52 gm/mi) x (20 mi) x (1 lb/454 gm) = 0.2 lb/day
Sulfur oxides - (No values are presented for SOx emissions)

For trucks:

((12 trucks) x (2 trips/truck) x (170 mi/trip)) + ((6 truck) x (2 trips/truck) x (35 mi/trip)) = 4,500 miles/day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (4,500 mi/day) = 59.4 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (4,500 mi/day) = 183.0 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (4,500 mi/day) x (0.9 lb ROG/1 lb/TOG) = 19.1 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (4,500 mi/day) = 5.5 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (4,500 mi/day) = 28.9 lb/day

The total off-site mobile exhaust emissions per day are:

Carbon monoxide	- 87.6 pounds per day
Nitrogen oxides	- 189.6 pounds per day
Reactive hydrocarbons	- 22.3 pounds per day
Sulfur oxides	- 5.7 pounds per day
PM-10 particulates	- 30.0 pounds per day

On-site Operations

Assuming that on-site operations are roughly half that from the proposed action, on-site heavy equipment and railroad operations are expected to generate the following levels of exhaust pollutants (includes water truck and railroad operations):

Carbon monoxide	- 24.4 pounds per day
Nitrogen oxides	- 75.8 pounds per day
Reactive hydrocarbons	- 15.8 pounds per day
Sulfur oxides	- 10.4 pounds per day
PM-10 particulates	- 7.8 pounds per day

Fuel Usage

Fuel usage will also be roughly half of that predicted in Section 4.5.2.4 and is anticipated at 288 gallons per day.

Fugitive Dust Emissions for Vehicle Travel and On-Site Operations

Off-site Mobile Emissions

As with the proposed project, dust which is "kicked-up" by the tires of haul trucks, employee traffic and the bus is 1.1, 0.1 and 0.8 pounds per mile, respectively.

For trucks:

E = 1.1 lb/mile

(18 trucks/day) x (2 trips/truck) x (10 mi/trip) = 360 miles/day

(360 miles) x (1.1 lb/mi) = 396 lb/day

For autos:

E = 0.1 lb/mile

(10 autos/day) x (2 trips/auto) x (10 mi/trip) = 200 miles/day

(200 miles) x (0.1 lb/mi) = 20 lb/day

For the bus:

E = 0.8 lb/mile

(1 bus/day) x (2 trips/bus) x (10 mi/trip) = 20 miles/day

(20 miles) x (0.8 lb/mi) = 8 lb/day

Assuming that regular watering of the road can attain a control efficiency of 80 percent:

(396 lb/day + 20 lb/day + 8 lb/day) x (0.36% PM-10) x (1-0.8) = 30.5 lb/day

On-site Operations

On-site operations would be roughly half of that predicted for the proposed action.

(313.6 lb/day) x (1-0.5) = 156.8 pounds of PM-10 per day

4.5.4 Transport by Trucks Only Without Rail Spur Alternative

Under this alternative the facility would be constructed as in the proposed project. The only difference with this alternative is that the railroad spur would not be constructed. This would raise the number of residuals trucks accessing the site from about 45 to 80 (plus 12 trucks for materials deliveries) during subsequent operations.

Initial construction and operational emissions would be those as presented for the proposed project and mitigation measures will remain unchanged. Further, no subsequent construction would be performed.

4.5.4.1 Subsequent Construction

No rail spur would be constructed and its accompanying emissions would be alleviated.

4.5.4.2 Subsequent Operations

Exhaust Emissions for Vehicle Travel and Heavy Equipment Operations

Vehicle Travel

ADT for Vehicle Travel

At full operation, truck traffic would increase from 57 to 92 trucks per day (including water and miscellaneous deliveries. The work force is still anticipated at 58 employees. This will yield a total fully operational ADT of 300 including miscellaneous materials deliveries. The break-down is as follows:

80 two-way heavy truck trips for waste deliveries (average 170 miles each direction).

12 two-way heavy truck trips for miscellaneous deliveries (average 35 miles in each direction).

58 two-way automobile trips for employee commutes (average 35 miles each direction).

For autos:

((58 emp) x (70 mi/emp)) = 4,060 miles per day

Carbon monoxide	-	(6.02 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 53.8 lb/day
Nitrogen oxides	-	(1.29 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 11.5 lb/day
Reactive organics	-	(0.81 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) x (0.9 lb ROG/1 lb/TOG) = 6.5 lb/day
Sulfur oxides	-	(0.05 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 0.4 lb/day
Particulates	-	(0.215 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 1.9 lb/day

For trucks:

((80 trucks/day) x (2 trips/truck) x (170 mi/trip)) + ((12 trucks/day) x (2 trips/truck) x (35 mi/trip)) = 28,040 miles/day

Carbon monoxide	- (5.99 gm/mi) x (1 lb/454 gm) x (28,040 mi/day) = 370.0 lb/day
Nitrogen oxides	- (18.46 gm/mi) x (1 lb/454 gm) x (28,040 mi/day) = 1,140.1 lb/day
Reactive organics	- (2.14 gm/mi) x (1 lb/454 gm) x (28,040 mi/day) x (0.9 lb ROG/1 lb/TOG) = 119.0 lb/day
Sulfur oxides	- (0.55 gm/mi) x (1 lb/454 gm) x (28,040 mi/day) = 34.0 lb/day
Particulates	- (2.92 gm/mi) x (1 lb/454 gm) x (28,040 mi/day) = 180.3 lb/day

Total off-site mobile exhaust emissions per day:

Carbon monoxide	- 423.8 lb/day
Nitrogen oxides	- 1,151.6 lb/day
Reactive hydrocarbons	- 125.5 lb/day
Sulfur oxides	- 34.4 lb/day
PM-10 particulates	- 182.2 lb/day

Fugitive Dust Emissions for Off-site Vehicle Travel

As shown in Section 4.5.2.2. Trucks and autos are expected to generated 0.11 and 0.001 pounds of dust per mile, respectively. For haul trucks and automobiles traveling along the site access road from Hector, the calculated emission factor uses the following values:

(92 trucks/day) x (2 trips/truck) x (10 mi/trip) = 1,840 miles per day

(1,840 miles/day) x (0.11 lb/mi) = 20.2 pounds per day

For autos:

(10 autos/day) x (2 trips/auto) x (10 mi/trip) = 200 miles per day

(200 miles/day) x (0.001 lb/mi) = 0.2 pounds per day

Total dust generated along the access corridor:

Assuming that regular watering of the access corridor can attain a control efficiency of 80 percent:

(2.2 lb + 0.2 lb) x (0.45% PM-10/PM-30) = 9.2 pounds of PM-10 per day

On-site Operations

Under this alternative the same volume of materials will be accepted and processed by the facility as with the proposed action. Thus, all on-site emissions will be the same as for the proposed facility and are presented in Section 4.5.2.4.

4.5.5 Rail Container Transfer Facility

Under this alternative the facility would be constructed as in the proposed project alternative. The only difference with this alternative is that the railroad spur would not be constructed. Instead, a transfer facility will be constructed at the Hector spur. Intermodal containers will be lifted off of the train and loaded onto trucks for the 10 to 14 mile trip to the facility along the access corridor. This would raise the number of trucks on the corridor from about 37 to 92. The number of trucks traveling on the interstates would be the same as for the proposed action.

Initial construction and operational emissions would be those as presented for the proposed project and mitigation measures will remain unchanged.

4.5.5.1 Subsequent Construction

ADT for Construction of the Access Transfer Station

The paved areas are to be constructed of 3 inches of asphaltic concrete over 6 inches of base and is assumed to encompass the full 4 acres. Base materials will be obtained on-site while asphalt will be delivered from the Barstow area. It is assumed that paving will take 5 working days, while the facility will take an additional 2 weeks to construct.

For asphalt deliveries:

(3 in) x (1 ft/12 in) x (4 acres) x (43,560 ft^2/acre) x (1 yd^3/27 ft^3) = 1,613 yd^3

Applicable road weights allow for approximately 20 tons of payload. Asphalt weighs approximately 3,000 pounds per cubic yard. Thus, trucks can haul 13 cubic yards per delivery.

(1,613 yd^3/13 yd^3/delivery) = (124 trips/5 days) = (25 deliveries per day x 2 trips per delivery) = 50 ADT

For base material deliveries:

(6 in) x (1 ft/12 in) x (4 acres) x (43,560 ft^2/acre) x (1 yd^3/27 ft^3) = 3,227 yd^3

Base trucks also typically haul 13 cubic yards per delivery.

(3,227 yd^3/13 yd^3) = (248 trips/5 days) = (50 deliveries per day x 2 trips per delivery) = 100 ADT

ADT for Vehicle Travel

During construction of the transfer station, truck traffic would increase from 57 to 82 trucks per day (including asphalt and miscellaneous deliveries). Assuming a similar work force as with initial operations, during transfer facility construction an ADT of approximately 286 along the access corridor and 280 on the public roads (including miscellaneous materials deliveries). The break-down for the access corridor is as follows:

45 two-way heavy truck trips for waste deliveries.

12 two-way heavy truck trips for miscellaneous deliveries.

25 two-way heavy truck trips for base material deliveries.

And on the public roadways:

45 two-way heavy truck trips for waste deliveries (average 170 miles each way).

12 two-way heavy truck trips for miscellaneous deliveries (average 35 miles each way).

58 two-way vehicle trips for employee commuting (average 35 miles each way).

Exhaust Emissions

Off-site Emissions:

For autos:

((58 autos/day) x (2 trips/auto) x (35 mi/trip)) = 4,060 mi/day

Carbon monoxide - (6.02 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 53.8 lb/day
Nitrogen oxides - (1.29 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 11.5 lb/day
Reactive organics - (0.81 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) x (0.9 lb ROG/1 lb/TOG) = 6.5 lb/day
Sulfur oxides - (0.05 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 0.4 lb/day
Particulates - (0.215 gm/mi) x (1 lb/454 gm) x (4,060 mi/day) = 1.9 lb/day

For truck emissions:

Daily material hauls are based upon the following:

45 loads of residuals
25 loads for asphalt
12 loads for cement, building materials, and water

Exhaust emissions are based upon 37 trucks at 70 miles per round trip for asphalt, cement, building materials and water and 45 trucks at an anticipated 340 miles per round trip for a daily total of 16,140 miles per day.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (17,890 mi/day) = 236.0 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (17,890 mi/day) = 727.4 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (17,890 mi/day) x (0.9 lb ROG/1 lb/TOG)=75.9 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (17,890 mi/day) = 26.7 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (17,890 mi/day) = 115.1 lb/day

Total off-site mobile exhaust emissions per day:

Carbon monoxide	- 289.8 pounds per day
Nitrogen oxides	- 738.9 pounds per day
Reactive hydrocarbons	- 82.4 pounds per day
Sulfur oxides	- 27.1 pounds per day
PM-10 particulates	- 117.0 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

Dust emissions will be as presented in Section 4.5.2.2, above. Approximately 57.4 pounds of PM-10 will be generated per day.

On-site emissions:

Exhaust emissions will also be produced by on-site heavy equipment operations. Additionally, the trucks which back-haul the aggregate to the transfer station area from the repository area could be construed as on-site emissions.

Heavy equipment includes those pieces as used in Section 4.5.2.3 and similar exhaust emissions would be produced. Emissions associated with heavy equipment operations (including a water truck)are:

Carbon monoxide	- 23.3 pounds per day
Nitrogen oxides	- 77.2 pounds per day
Reactive hydrocarbons	- 7.7 pounds per day
Sulfur oxides	- 8.4 pounds per day
PM-10 particulates	- 7.4 pounds per day

Further, on-site truck travel will be on the order of 25.6 miles per day. Additionally, exhaust emissions would be produced by the 50 trucks which bring aggregate from the repository. These haul emissions are calculated as:

Carbon monoxide	- (5.99 gm/mi) x (1 lb/454 gm) x (1,025.6 mi/day) = 13.5 lb/day
Nitrogen oxides	- (18.46 gm/mi) x (1 lb/454 gm) x (1,025.6 mi/day) = 21.2 lb/day
Reactive organics	- (2.14 gm/mi) x (1 lb/454 gm) x (1,025.6 mi/day) x (0.9 lb ROG/1 lb/TOG) = 4.3 lb/day
Sulfur oxides	- (0.55 gm/mi) x (1 lb/454 gm) x (1,025.6 mi/day) = 1.2 lb/day
Particulates	- (2.92 gm/mi) x (1 lb/454 gm) x (1,025.6 mi/day) = 6.6 lb/day

Total on-site exhaust emissions per day:

Carbon monoxide	- 36.8 pounds per day
Nitrogen oxides	- 98.4 pounds per day
Reactive hydrocarbons	- 12.0 pounds per day
Sulfur oxides	- 9.6 pounds per day
PM-10 particulates	- 14.0 pounds per day

Fugitive Dust Emissions for On-Site Vehicle Travel and Operations

Vehicle Travel

As shown in Section 4.5.2.2, if on-site haul trucks are used to move residuals from the receiving area to the repository, 12.1 pounds of PM-10 dust will be generated daily. The water truck is expected to produce an additional 6 pounds daily.

Transfer Station Installation

The construction of the transfer station is anticipated to take 3 weeks. The area to be disturbed is approximated at 4 acres.

AP-42 predicts fugitive dust from civil construction at 1.2 tons per acre per month of activity based upon a 30 percent silt content (AP-42, 1988, Section 11.2.4). On-site sieve analysis determined the surface soil to contain an average of about 9 percent silt.

(4 acres/0.75 mo) x (1.2 tons/ac/mo) = 6.4 tons per month
(6.4 tons/mo) x (1 mo/30 days) x (2,000 lb/ton) = 426.7 pounds per day

Assuming 50 percent control efficiency:

(426.7 lb/day) x (1-0.5) = 213.3 pounds per day

PM-10 dust comprises approximately 45 percent of the PM-30 (AP-42, Section 11.2.1)

(213 lb/day) x (0.45%) x (9%/30%) = 28.8 pounds of PM-10 per day

Ballast will be hauled from the repository area to the area of active construction. These hauls are averaged at 750 feet over gravel, 10 miles of industrial paved roads and 500 feet of soil in each direction. As shown in Sections 4.5.2.1 and 4.5.2.2, scraper travel over the soil, gravel and paved roads generates 8.0, 4.4 and 0.9 pounds of dust per mile traveled, respectively. Both the values presented for gravel and soil are for PM-10 material, whereas the travel over the paved surface must be multiplied by 45 percent for PM-10 emissions. Water control is expected to attain a control efficiency of 80 percent over the paved and gravel roads and 50 percent over the soil. Truck travel is anticipated at an average of 1,500 feet over gravel, 20 miles over paved road and 1,000 feet over soil for both ends of the trip. The total amount of dust generated from truck travel is then calculated at:

(50 trucks) x ((1,500 ft/5,280 ft/mi x 4.4 lb/mi) x (1-0.8) + (20 mi x 0.9 lb/mi) x (1-0.8) x (45%) + (1,000 ft/5,280 ft/mi x 8.0 lb/mi) x (1-0.5) = 115.2 pounds of PM-10 dust per day

The 50 trucks that are to deliver the aggregate to the railroad station construction area will need to be loaded and unloaded. Assuming that each truck can transport 20 tons per load, 1,000 tons will be transported on a daily basis during railroad construction. Batch drops generate 0.0024 pounds of PM-10 dust per ton loaded. Assuming that the 1,000 tons is dropped twice (once onto the trucks and once from the trucks and water control can attain a 50 percent control efficiency:

(1,000 tons/day) x (0.0024 lb/ton) x (2 loads per day) x (1-0.5)= 2.4 pounds of PM-10 dust per day

Other On-site Operations

Batch drops:

AP-42, Section 8.19.1 lists batch drops from truck unloading generate 0.0024 lb of PM-10 emissions per ton unloaded.

(45 trucks/day) x (20 tons/truck) x (0.0024 lb/ton) = 2.2 pounds per day

For unloading within the facility this value will be negligible.

Conveyor losses:

AP-42, Section 8.19.2 lists covered conveyor losses at 0.0002 pounds of PM-10 emissions per ton of material conveyed.

(45 trucks/day) x (20 tons/truck) x (0.0002 lb/ton) = 0.2 pounds per day

Fugitive losses from repository loading:

As in Section 4.5.2.2., these emissions are estimated at 2.2 pounds of PM-10 dust per day. Further, as the dumping operations into both the silos and the trapezoids will be controlled using temporary dust covers, these emissions are considered negligible.

Fugitive losses from excavation:

During this phase, excavation operations will cease. Thus the only losses from the excavation area will be that due to erosion and truck loading to provide ballast material.

Scraper Loading

An estimated 32 loads per day will be removed from the area of the excavation over both 750 feet of soil and gravel. The scraper can move approximately 30 cubic yards per load or about 40 tons. Thus, 1,280 tons will be moved on a daily basis.

Total suspended particulate losses for topsoil removal utilizing scrapers are presented as 0.058 lb of PM-30 dust per ton of material excavated. AP-42, Section 11.2.1 shows that PM-10 dust is 0.36/0.80 or 45 percent of PM-30 dust. Control efficiency is estimated at 50 percent.

(1,280 tons/day) x (0.058 lb/ton) x (45% PM-10/PM-30) x (1-0.5) = 16.7 pounds of PM-10 dust per day

Scraper Travel

Travel on the unpaved working area will raise dust. It is estimated that 32 loads per day will be removed from the bermed area around the open pit. The entrance to the area will be covered with gravel while the perimeter will be dirt. The equipment is to carry the soil from the active area to the berm and will drive over approximately 750 feet of gravel and 750 feet of dirt for a total trip of 3,000 feet per load.

As shown in Phase 4, above, scrapers generate 1.5 and 0.7 pounds of PM-10 dust per mile for travel over dirt and gravel, respectively. Assuming that watering can reduce dust lofting by 50 percent over dirt and 80 percent over gravel, then the amount of PM-10 released into the atmosphere is calculated as:

(32 loads) x ((1,500 ft/load) x (1 mi/5,280 ft) x (1.5 lb/mi) x (1-0.5) + (1,500 ft/load) x (1 mi/5,280 ft) x (0.7 lb/mi) x (1-0.8) = 8.1 pounds of PM-10 dust per day

Scraper Unloading

AP-42, Section 8.24.4 estimates that drops from scrapers generate 0.04 pounds of PM-30 dust per ton unloaded. AP-42, Section 11.2.1 shows that PM-10 dust is 0.36/0.80 or 45 percent of PM-30 dust. Assuming 50 percent control efficiency:

(1,280 tons/day) x (0.04 lb of PM-30/ton) x (0.45% PM-10/PM-30) x (1-0.5) = 11.5 pounds of PM-10 per day

Excavation Erosion

Dust will also be generated as a result of wind erosion of the open excavation. The maximum area of disturbance at any one time is anticipated at 40 acres. As shown in Section 4.5.2.2 above, this value is estimated at 6.2 pounds per day.

Rock Plant Emissions

Rock plant emissions will be similar to those presented in Section 4.5.2.1 and would be expected to produce approximately 12.2 pounds of PM-10 emissions per day for a controlled facility. Stockpile erosion will also be similar to that presented in Section 4.5.2.1 and are 0.1 pound of PM-10 dust per day.

Batch Plant

The concrete batch plant will continue to operate at a rate of 50 tons per hour and expected emissions are 5.9 pounds of PM-10 per day as presented in Phase 4, above.

The total PM-10 loading for the site is the combined PM-10 for dust from erosion, construction equipment exhaust emissions, on-site truck travel and the rock and batch plants and that for on-site construction equipment. This total amount of PM-10 generated on-site is calculated as:

(65.3 lb/day for active construction) + (6.3 lb/day for wind erosion) + (150.3 lb/day for internal travel including the movement of aggregate to the transfer station area) + (12.2 lb/day for rock plant) + (5.9 lb/day for batch plant) + (14.0 lb/day for exhaust emissions) + (2.4 lb/day for batch drops) = 256.4 pounds of PM-10 per day

Miscellaneous Sources

Evaporative fuel losses:

AP-42, Section 4.5 lists transfer operations for diesel loading from tank trucks at 0.03 lb per 1,000 gallons transferred. Six pieces of equipment are anticipated for on-site operations. As previously discussed, the average fuel consumption for heavy equipment is approximately 12 gallons per hour.

(5 pieces) x (12 gal/hr) x (8 hr/day) = 480 gallons per day

(480 gal) x (0.03 lb/1,000 gal) = 0.01 pounds per day

4.5.5.2 Subsequent Operations

Exhaust Emissions for Vehicle Travel and Heavy Equipment Operations

Vehicle travel

ADT for Vehicle Travel

The rock and batch plants would be used for the on-site construction of the waste storage silos and off-site export of rock. This export would utilize trucks which had brought in waste materials. Thus, few if any additional trips would be generated from the operations of the rock and batch plants.

At full operation, truck traffic would increase from 37 to 92 trucks per day along the access corridor. Extra personnel will be necessary to drive these trucks and staff the transfer facility. The full staff is then anticipated at 74 employees. This will yield a total fully operational ADT of approximately 206 along the corridor and 222 along the public roads including miscellaneous materials deliveries. The break-down is as follows:

- 60 two-way vehicle trips for employee commuting (average 25 miles each direction).
- 10 two-way vehicle trips for employee commuting (average 35 miles each direction).
- 1 two-way bus trip along the access corridor for employee commuting (average 10 miles each direction).
- 25 two-way heavy truck trips for waste deliveries (average 170 miles each direction).
- 12 two-way heavy truck trips for miscellaneous deliveries (at 35 miles each way).
- 55 two-way heavy truck trips along the access corridor for train brought wastes (at 10 miles each way).

For off-site emissions:

((25 trucks/day) x (2 trips/truck) x (170 mi/trip)) + ((12 trucks/day) x (2 trips/truck) x (35 mi/trip)) + ((58 trucks/day) x (2 trips/truck) x (10 miles/trip)) = 9,340 miles/day

Carbon monoxide	- (5.99 gm/mi) x (1 pound/454 gm) x (9,340 mi/day) = 123.2 pounds/day
Nitrogen oxides	- (18.46 gm/mi) x (1 pound/454 gm) x (9,340 mi/day) = 379.8 pounds/day
Reactive organics	- (2.14 gm/mi) x (1 pound/454 gm) x (9,340 mi/day) x (0.9 pounds ROG/1 pound/TOG) = 39.6 pounds/day
Sulfur oxides	- (0.55 gm/mi) x (1 pound/454 gm) x (9,340 mi/day) = 11.3 pounds/day
Particulates	- (2.92 gm/mi) x (1 pound/454 gm) x (9,340 mi/day) = 60.2 pounds/day

74 two-way vehicle trips for employee commuting.

(64 autos/day) x (2 trips/auto) x (25 mi/trip) + (10 autos/day) x (2 trips/auto) x (35 mi/trip) = 3,900 mi/day

Carbon monoxide	- (6.02 gm/mi) x (1 pound/454 gm) x (3,900 mi/day) = 51.7 pounds/day
Nitrogen oxides	- (1.29 gm/mi) x (1 pound/454 gm) x (3,900 mi/day) = 11.1 pounds/day
Reactive organics	- (0.81 gm/mi) x (1 pound/454 gm) x (3,900 mi/day) x (0.9 pounds ROG/1 pound/TOG) = 6.2 pounds/day
Sulfur oxides	- (0.05 gm/mi) x (1 pound/454 gm) x (3,900 mi/day) = 0.4 pounds/day
Particulates	- (0.215 gm/mi) x (1 pound/454 gm) x (3,900 mi/day) = 1.8 pounds/day

Bus emission are as presented in Section 4.5.2.4. Total mobile exhaust emissions per day:

Carbon monoxide	- 177.2 pounds per day
Nitrogen oxides	- 392.0 pounds per day
Reactive hydrocarbons	- 45.9 pounds per day
Sulfur oxides	- 11.7 pounds per day
PM-10 particulates	- 62.2 pounds per day

On-site operations

Under this alternative the same volume of materials will be accepted and processed by the facility as with the proposed action. Thus, all on-site emissions will be the same as for the proposed facility and are presented in Section 4.5.2.4. However, the haul trips between the transfer facility and the repository could now be considered as on-site emissions as these trucks will be operated by the facility.

(55 trucks/day) x (2 trips/truck) x (10 mi/trip) = 1,100 miles/day

Carbon monoxide	- (5.99 gm/mi) x (1 pound/454 gm) x (1,100 mi/day) = 14.5 pounds/day
Nitrogen oxides	- (18.46 gm/mi) x (1 pound/454 gm) x (1,100 mi/day) = 44.7 pounds/day
Reactive organics	- (2.14 gm/mi) x (1 pound/454 gm) x (1,100 mi/day) x (0.9 pounds ROG/1 pound/TOG) = 4.7 pounds/day
Sulfur oxides	- (0.55 gm/mi) x (1 pound/454 gm) x (1,100 mi/day) = 1.3 pounds/day
Particulates	- (2.92 gm/mi) x (1 pound/454 gm) x (1,100 mi/day) = 7.1 pounds/day

Fugitive Dust Emissions for Subsequent Operations

Dust generation for the facility and the access corridor would be essentially the same as for the Transport by Trucks Only Without Rail Spur Alternative as presented in Section 4.5.4.3. However, the dust associated with those trucks wich pick up containers at the transfer facility could now be considered as on-site emissions. All other dust emissions remain as with the proposed action. Assuming that regular watering of the access road can attain an 80 percent control efficiency:

(55 trucks) x (10 mi/trip) x (2 trips/truck) x (0.11 lb/mi) x (45% PM-10/PM-30) x (1-0.8) = 10.9 pounds of PM-10 dust

Mitigations

Mitigations are as presented in Section 4.5.2.4.

4.5.6 Access Corridor Alternatives

Under this alternative, the access corridor could be extended to as much as 14 miles. During initial construction, the time for corridor construction would be extended by 40 percent, but daily emissions would remain as with the proposed action. Assuming the 14 mile route, this will effective add 3 percent to residual haul truck emissions, 9 percent to automobile emissions and 40 percent to the bus emissions. No on-site emissions would be affected by this alternative.

Initial Operations

During initial operations 57 trucks, 10 employees and a shuttle bus would access the site on a daily basis.

For employees:

((48 emp) x (50 mi/emp)) + ((10 emp) x (78 mi/emp)) = 3,180 miles per day

Carbon monoxide	- (6.02 gm/mi) x (1 lb/454 gm) x (3,180 mi/day) = 42.2 lb/day
Nitrogen oxides	- (1.29 gm/mi) x (1 lb/454 gm) x (3,180 mi/day) = 9.0 lb/day
Reactive organics	- (0.81 gm/mi) x (1 lb/454 gm) x (3,180 mi/day) x (0.9 lb ROG/1 lb/TOG) = 5.1 lb/day
Sulfur oxides	- (0.05 gm/mi) x (1 lb/454 gm) x (3,180 mi/day) = 0.4 lb/day
Particulates	- (0.215 gm/mi) x (1 lb/454 gm) x (3,180 mi/day) = 1.5 lb/day

For bus emissions:

Bus emissions are calculated in accordance with AP-42, Table N-1, Diesel Powered Transit Bus Emission Factors. The bus is estimated to travel a distance of 28 miles per day.

Carbon monoxide	- (51.9 gm/mi) x (28 mi) x (1 lb/454 gm) = 3.2 lb/day
Nitrogen oxides	- (26.1 gm/mi) x (28 mi) x (1 lb/454 gm) = 1.6 lb/day
Hydrocarbons	- (3.35 gm/mi) x (28 mi) x (1 lb/454 gm) = 0.2 lb/day
Particulates	- (5.52 gm/mi) x (28 mi) x (1 lb/454 gm) = 0.3 lb/day
Sulfur oxides	- (No values are presented for SOx emissions)

For truck emissions:

Daily material hauls are based upon the following:
45 loads of residuals
12 loads for cement, building materials, and water

Exhaust emissions are based upon 12 trucks at 78 miles per round trip for cement, building materials and water and 45 trucks at an anticipated 348 miles per round trip for a daily total of 16,596 miles per day.

Carbon monoxide	- (5.99 gm/mi) x (1 lb/454 gm) x (16,596 mi/day) = 219.0 lb/day
Nitrogen oxides	- (18.46 gm/mi) x (1 lb/454 gm) x (16,596 mi/day) = 674.8 lb/day
Reactive organics	- (2.14 gm/mi) x (1 lb/454 gm) x (16,596 mi/day) x (0.9 lb ROG/1 lb/TOG) = 70.4 lb/day
Sulfur oxides	- (0.55 gm/mi) x (1 lb/454 gm) x (16,596 mi/day) = 20.1 lb/day
Particulates	- (2.92 gm/mi) x (1 lb/454 gm) x (16,596 mi/day) = 106.7 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide	- 264.4 pounds per day
Nitrogen oxides	- 685.4 pounds per day
Reactive hydrocarbons	- 75.7 pounds per day
Sulfur oxides	- 20.5 pounds per day
PM-10 particulates	- 108.5 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

As shown in Section 4.5.2.2. Trucks, autos, and the bus are expected to generated 1.1, 0.1 and 0.8 pounds of dust per mile, respectively. For haul trucks and automobiles traveling along the site access road from Hector, the calculated emission factor uses the following values:

(57 trucks/day) x (2 trips/truck) x (14 mi/trip) = 1,596 miles per day

(1,596 miles/day) x (1.1 lb/mi) = 1,756 pounds per day

For autos:

(10 autos/day) x (2 trips/auto) x (14 mi/trip) = 280 miles per day

(280 miles/day) x (0.1 lb/mi) = 28 pounds per day

For bus:

(1 bus/day) x (2 trips/bus) x (14 mi/trip) = 28 miles per day

(28 miles/day) x (0.8 lb/mi) = 22 pounds per day

Total dust generated along the access corridor:

Assuming that regular watering of the access corridor can attain a control efficiency of 80 percent:

(1,756 lb + 28 lb + 22 lb) x (0.36% PM-10) x (1-0.8) = 130.0 pounds of PM-10 per day

Subsequent Operations

During subesquent operations the volume of trucks along the access corridor will drop from 57 to 37. Employee and bus emissions are as for initial operations.

For truck emissions:

Daily material hauls are based upon the following:
25 loads of residuals
12 loads for cement, building materials, and water

Exhaust emissions are based upon 12 trucks at 78 miles per round trip for cement, building materials and water and 25 trucks at an anticipated 348 miles per round trip for a daily total of 9,636 miles per day.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (9,636 mi/day) = 127.1 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (9,636 mi/day) = 391.8 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (9,636 mi/day) x (0.9 lb ROG/1 lb/TOG) = 40.9 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (9,636 mi/day) = 11.7 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (9,636 mi/day) = 62.0 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide	- 172.5 pounds per day
Nitrogen oxides	- 402.4 pounds per day
Reactive hydrocarbons	- 46.2 pounds per day
Sulfur oxides	- 12.1 pounds per day
PM-10 particulates	- 63.8 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

As shown in Section 4.5.2.2. Trucks, autos, and the bus are expected to generated 1.1, 0.1 and 0.8 pounds of dust per mile, respectively. Automobie and bus emissions are as presented in Initial Operations, above. For haul trucks traveling along the site access road from Hector, the calculated emission factor uses the following values:

(37 trucks/day) x (2 trips/truck) x (14 mi/trip) = 1,036 miles per day

(1,036 miles/day) x (1.1 lb/mi) = 1,140 pounds per day

Total dust generated along the access corridor:

Assuming that regular watering of the access corridor can attain a control efficiency of 80 percent:

(1,140 lb + 28 lb + 22 lb) x (0.36% PM-10) x (1-0.8) = 85.7 pounds of PM-10 per day

4.5.7 Bristol Mountain Alternative

4.5.7.1 Initial Construction

Under this alternative a facility of similar size and workings would be constructed at Bristol Mountain, approximately 25 miles east of the proposed site. All on-site operations and volumes of both residuals and aggregate would also be as presented for the proposed project. Thus, the only difference lies in the length of the access corridor and the distance from metropolitan centers. Access to the site would entail approximately 17 additional miles along I-40 and 6 additional miles along the access corridor. Thus, the difference in distance is 23 miles.

Off-site emissions would be raised by 60 percent as the site is located 60 percent further from the greater Barstow area.

All on-site emissions and fuel consumption are as presented for the proposed action with the difference being that Phases 1 through 3 would be extended from 69 days to 96 days.

4.5.7.2 Initial Operations

The initial operations included in Phase 6 are as presented for the proposed action. As with initial construction, differences stem from the longer access to the site. All on-site generated emissions are as presented for the proposed action. Emission factors are as presented in Section 4.5.2.2.

Off-Site Emissions

Exhaust Emissions for Off-site Vehicle Travel:

For employees:

Worker commute exhaust emissions are based upon 48 employees traveling an average round trip distance of 84 miles, 10 employees traveling a round trip distance of 116 miles and one bus averaging 32 miles a day to shuttle employees from Hector to the site.

([48 emp] x [84 mi/emp]) + ([10 emp] x [116 mi/emp]) = 5,192 miles per day

Carbon monoxide - (6.02 gm/mi) x (1 lb/454 gm) x (5,192 mi/day) = 68.8 lb/day
Nitrogen oxides - (1.29 gm/mi) x (1 lb/454 gm) x (5,192 mi/day) = 14.8 lb/day
Reactive organics - (0.81 gm/mi) x (1 lb/454 gm) x (5,192 mi/day) x (0.9 lb ROG/1 lb/TOG) = 8.3 lb/day
Sulfur oxides - (0.05 gm/mi) x (1 lb/454 gm) x (5,192 mi/day) = 0.6 lb/day
Particulates - (0.215 gm/mi) x (1 lb/454 gm) x (5,192 mi/day) = 2.5 lb/day

For bus emissions:

Bus emissions are calculated in accordance with AP-42, Table N-1, Diesel Powered Transit Bus Emission Factors. The bus is estimated to travel a distance of 36 miles per day.

Carbon monoxide - (51.9 gm/mi) x (36 mi) x (1 lb/454 gm) = 3.7 lb/day
Nitrogen oxides - (26.1 gm/mi) x (36 mi) x (1 lb/454 gm) = 1.8 lb/day
Hydrocarbons - (3.35 gm/mi) x (36 mi) x (1 lb/454 gm) = 0.2 lb/day
Particulates - (5.52 gm/mi) x (36 mi) x (1 lb/454 gm) = 0.4 lb/day
Sulfur oxides - (No values are presented for SOx emissions)

For truck emissions:

Daily material hauls are based upon the following:

45 loads of residuals
12 loads for cement, building materials, and water

Exhaust emissions are based upon 12 trucks at 116 miles per round trip for cement, building materials and water and 45 trucks at an anticipated 386 miles per round trip for a daily total of 18,762 miles per day.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (18,762 mi/day) = 247.5 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (18,762 mi/day) = 762.9 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (18,762 mi/day) x (0.9 lb ROG/1 lb/TOG) = 79.6 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (18,762 mi/day) = 22.7 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (18,762 mi/day) = 120.7 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide - 320.0 pounds per day
Nitrogen oxides - 779.5 pounds per day
Reactive hydrocarbons - 88.1 pounds per day
Sulfur oxides - 23.3 pounds per day
PM-10 particulates - 123.6 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

Dust will be generated along the access corridor from automobiles and heavy trucks which access the site. As the corridor is to be 60 percent longer than that for the proposed site, all off-site dust emissions will be raised by 60 percent. Thus, the amount of PM-10 dust raised along the access corridor on a daily bases is calculated at 148.6 pounds per day.

4.5.7.3 Subsequent Construction

As per the proposed action, final build-out plans call for the installation of a railroad spur after two to three years of operation. However, in this Alternative the spur will be approximately 16 miles instead of 10 miles in length.

Emissions for Off-site Vehicle Travel

The work force, number of haul trucks and off-site exhaust and fugitive dust emissions are as presented for the initial operations presented in Section 4.7.2.2.

On-site Operations

All on-site exhaust emissions are as presented for the proposed project with the exception being the emissions produced by both the haul trucks which would back-haul aggregate from the repository area to the rail spur area and the water truck which would travel to the spur area during active construction.

During the construction of the railroad spur, material will be back-hauled from the repository area to the area of active construction. Assuming that the spur line is 16 miles long, the water truck will cover an average distance of approximately 18 miles. This distance will be longer for work near I-40, but will be shorter when nearing the facility. Thus, the average travel distance is approximately 8 miles in each direction. Twice watering the active area will take another approximately 2 miles per day for a total daily trip of approximately 18 miles. Inactive areas will be treated with a dust palliative and will not require daily watering.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (18 mi/day) = 0.2 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (18 mi/day) = 0.7 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (18 mi/day) x (0.9 lb ROG/1 lb/TOG) = 0.1 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (18 mi/day) = 0.02 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (18 mi/day) = 0.1 lb/day

On a daily basis, 80 loads of aggregate removed from the bermed area will be trucked to the area of railroad construction. This distance will vary from immediately adjacent to the facility to as many as 16 miles away when working near I-40 for an average one-way distance of 8 miles. These trucks will travel over the approximate 750 feet of gravel road, the 8 miles of paved road and approximately 500 feet of soil on each leg of the trip. Exhaust emissions will be generated along the length of the trip.

((8 mi/load) + (750 ft/5,280 ft/mi) + (500 ft/5,280 ft/mi)) x 2 trips = 16.5 miles per trip

(80 loads/day) x (16.5 mi/load) = 1,320 miles per day

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (1,320 mi/day) = 17.4 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (1,320 mi/day) = 53.7 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (1,320 mi/day) x (0.9 lb ROG/1 lb/TOG) = 5.6 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (1,320 mi/day) = 1.6 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (1,320 mi/day) = 8.5 lb/day

The total on-site exhaust emissions per day are:

Carbon monoxide	- 53.9 pounds per day
Nitrogen oxides	- 170.9 pounds per day
Reactive hydrocarbons	- 14.0 pounds per day
Sulfur oxides	- 17.1 pounds per day
PM-10 particulates	- 20.4 pounds per day

Fugitive Dust Emissions for On-site Vehicle Travel and Operations

Vehicle Travel

As shown in Section 4.5.2.2, if on-site haul trucks are used to move residuals from the receiving area to the repository, 0.8 pounds of PM-10 dust will be generated daily.

Additionally, these trucks will pass over gravel roads on their way to the repository. This is value is also as presented in Section 4.5.2.2 and with water control is estimated at 11.3 pounds of PM-10 dust per day.

As discussed above, the water truck is expected to drive about 12 miles per day with an anticipated truck weight of approximately 20 tons when full and 4 tons when empty for an average weight of 12 tons. These trucks will travel over paved and graveled roads and, in the construction area, dirt. These trucks typically have 10 wheels. Assuming a worst case scenario, the entire 12 miles were assumed to be over dirt. The average speed is anticipated at 5 miles per hour:

$E = 0.36(5.9)\ (9/12)\ (5/30)\ (12/3)^{0.7}\ (10/4)^{0.5}\ (365\text{-}p/365)$ (lb/VMT)

E = 1.0 pounds of PM-10 per mile

(12 mi/day) x (1.0 lb/mi) = 12.0 pounds of PM-10 per day

Assuming that the water can reduce dust lofting by 50%:

(12 lb/day) x (1-0.5) = 6.0 pounds of PM-10 per day

Railroad Installation

Fugitive dust from the actual construction of the railroad is as presented in Section 4.5.2.3 with the time frame extended by about 60 percent. Additional exhaust and dust will be generated as a result of the longer distances that aggregate must be back-hauled for railroad ballast.

Ballast will be hauled from the repository area to the area of active construction. Truck travel is anticipated at an average of 1,500 feet over gravel, 16 miles over paved road and 1,000 feet over soil for both ends of the trip. Emission factors are as presented in Section 4.5.2.3. The total amount of dust generated from truck travel is then calculated at:

(80 trucks) x ((1,500 ft/5,280 ft/mi x 4.4 lb/mi) x (1-0.8) + (16 mi x 0.9 lb/mi) x (1-0.8) x (36%) + (1,000 ft/5,280 ft/mi x 8.0 lb/mi) x (1-0.5) = 163.6 pounds of PM-10 dust per day

All other on-site generated emissions (including railroad installation) are as presented for the proposed action in Section 4.5.2.3.

4.5.7.4 Subsequent Operations

All subsequent operations (Phase 8), will be as presented for the proposed project with the only differences being in the additional exhaust generated by the Trackmobile and vehicle miles traveled due to the further distances.

Off-site vehicle travel:

Upon operation of the rail spur, truck traffic would decrease from 45 to 25 trucks per day. The daily ADT is based on the following:

- 48 two-way vehicle trips for employee commuting (average 42 miles each direction).
- 10 two-way vehicle trips for employee commuting (average 58 miles each direction).
- 1 two-way vehicle trip for the shuttle bus (average 16 miles each direction).
- 25 two-way heavy truck trips for waste deliveries (average 193 miles each direction).
- 12 two-way heavy truck trips for miscellaneous deliveries (average 58 miles each direction).

Auto, bus and truck emissions are as presented in Section 4.5.2.2, above.

For employees:

Worker commute exhaust emissions are as presented in Section 4.5.7.2.

For truck emissions:

Daily material hauls are based upon the following:

25 loads of residuals
12 loads for cement, building materials and water

Exhaust emissions are based upon 12 trucks at 116 miles per round trip for cement, building materials and water and 25 trucks at an anticipated 193 miles in each direction for a daily total of 11,040 miles per day.

Carbon monoxide - (5.99 gm/mi) x (1 lb/454 gm) x (11,040 mi/day) = 145.7 lb/day
Nitrogen oxides - (18.46 gm/mi) x (1 lb/454 gm) x (11,040 mi/day) = 449.0 lb/day
Reactive organics - (2.14 gm/mi) x (1 lb/454 gm) x (11,040 mi/day) x (0.9 lb ROG/1 lb/TOG) = 46.8 lb/day
Sulfur oxides - (0.55 gm/mi) x (1 lb/454 gm) x (11,040 mi/day) = 13.4 lb/day
Particulates - (2.92 gm/mi) x (1 lb/454 gm) x (11,040 mi/day) = 71.0 lb/day

Total mobile exhaust emissions per day:

Carbon monoxide - 218.2 pounds per day
Nitrogen oxides - 465.6 pounds per day
Reactive hydrocarbons - 55.3 pounds per day
Sulfur oxides - 14.0 pounds per day
PM-10 particulates - 73.9 pounds per day

Fugitive Dust Emissions for Off-site Vehicle Travel

Fugitive dust generated along the access corridor will be 60 percent greater than that for the proposed action due to the fact that the road would be 60 percent longer.

On-site Exhaust Emissions

With the exception of the railroad operations, all exhaust emissions will be as presented for the proposed action as presented in Section 4.5.2.4.

Railroad Operations:

The railroad spur being 60 percent longer for this alternative will generate 60 percent more emissions each day. Thus, the calculated emissions are as follows:

Carbon monoxide - (9.3 lb/day) x (1.6) = 14.9 pounds per day

Exhaust hydrocarbons - (21.3 lb/day) x (1.6) = 34.1 pounds per day

Nitrogen oxides - (26.2 lb/day) x (1.6) = 41.9 pounds per day

Reactive organics - (0.6 lb/day) x (1.6) = 1.0 pounds per day

Sulfur oxides - (6.3 lb/day) x (1.6) = 10.1 pounds per day

Particulates - (2.8 lb/day x (1.6) = 4.5 pounds per day

The total on-site exhaust emissions (including the railcar mover) per day are:

Carbon monoxide - 50.4 pounds per day
Nitrogen oxides - 158.1 pounds per day
Reactive hydrocarbons - 32.6 pounds per day
Sulfur oxides - 24.6 pounds per day
PM-10 particulates - 17.3 pounds per day

Fugitive Dust for On-site Operations

Fugitive dust for on-site operations are as presented for the proposed action in Section 4.5.2.4.

4.5.8 No Action Alternative

Under this alternative no site would be constructed and no impacts are generated. Thus, no mitigation measures would be necessary.

APPENDIX E3 - AUTHORITY TO CONSTRUCT APPLICATION

GODDARD & GODDARD ENGINEERING

Environmental Studies

Robert G. Zeller, Air Quality Engineer
San Bernardino County Air Pollution
Control District
15428 Civic Dr.
Victorville, CA 92392

May 29, 1991

RE: Hidden Valley Resources, Inc. ATC Application

Dear Robert:

The enclosed Authority to Construct Application follows your comments concerning reducing the Total Suspended Particulate emissions below the 250 lb TSP/dy district limit. Note that the air quality impacts estimated in the G&GE Health Risk Assessment which were below applicable CAAQS and Health Risk Prop 65 significance levels will now be further reduced.

We have discussed the needed TSP reductions with Brian Patrick, President/Manager/Engineer and Allen Henderson Manager/Engineer, HVR, Inc. and have their concurrence on the following described project construction phasing changes and on the normal truck and normal truck/rail operations:

Phases 1, 2 and 3:

Phase 1 Hector access road construction and paving, phase 2 facilities and containment road construction and paving, and phase 3 facility area grading and paving.

- o lengthen construction period from 45 to 90 days for phase 1, from 17 to 34 days for phase 2, and from 7 to 14 days for phase 3;
- o reduce inactive area to 1 mile in phases 1 and 2;
- o reduce road construction rate from 1,170 ft/dy to 587 ft/dy in phases 1 and 2 and to 0.403 acre/dy in phase 3;
- o reduce aggregate and asphalt trucking rate by 50%;

These modifications are estimated to reduce the TSP per phase to 226 lb TSP/dy for Phase 1, 226 lb TSP/dy for Phase 2 and 194 lb TSP/dy for Phase 3.

Phase 4:
HVR facility area construction and initial repository excavation:

- o reduce the initial excavation requirement from 590,000 cyd to 330,000 cyd which reduces the necessary carry-all scrapers from 5 to 3;
- o reduce the bulldozer operation time from 8 to 4 hours per day;
- o reduce the active construction area from 1 to 0.5 acres.

These modifications are estimated to reduce the TSP for phase 4 to 236 lb TSP/dy.

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6870 Frontage Rd., Lucerne, CA 95458-8504 (707) 274-2171

Phase 5:
HVR containment area construction and continuing repository excavation:

- o reduce the initial excavation requirement from 590,000 cyd to 330,000 cyd which reduces the necessary carry-all scrapers from 4 to 2;
- o reduce the bulldozer operation time from 8 to 4 hours per day;
- o reduce the active construction area from 1 to 0.5 acres;

These modifications are estimated to reduce the TSP for phase 5 to 237 lb TSP/dy.

Phase 6:
HVR normal operation before railroad option with continuing containment area construction and repository excavation:

- o reduce excavation to 1 carry-all scraper;
- o reduce bulldozer operation from 8 to 4 hours per day;
- o reduce construction area from 1 to 0.5 acres;
- o reduce wind erosion by 50% by combining the hexagonal and trapezoidal containment structures;
- o pave or oil all temporary back-haul access spurs.

These modifications are estimated to reduce the TSP for phase 6 to 231 lb TSP/dy.

Phase 7:
HVR normal operation with railroad construction option and continuing containment area construction:

- o stop carry-all activities;
- o reduce bulldozer operation from 8 to 4 hours per day;
- o reduce construction area from 1 to 0.5 acres;
- o reduce wind erosion by 50% by combining the hexagonal and trapezoidal containment structures;
- o pave or oil all temporary rail base rock haul access spurs.

These modifications are estimated to reduce the TSP for phase 7 to 240 lb TSP/dy.

Phase 8:
HVR normal operation with truck and rail delivery, continuing containment area construction and repository excavation:

- o reduce excavation to 1 carry-all scraper;
- o reduce bulldozer operation from 8 to 4 hours per day;
- o reduce construction area from 1 to 0.5 acres;
- o reduce wind erosion by 50% by combining the hexagonal and trapezoidal containment structures;
- o pave or oil all temporary back-haul access spurs.

These modifications are estimated to reduce the TSP for phase 8 to 218 lb TSP/dy.

The phasing heavy equipment complement is listed in Table 1 with the TSP per phase shown in Figures 1, 2 and 3. As you will see, each phase as modified is below the 250 lb TSP/dy limit. All phases shown in Figure 1, Phase 6 shown in Figure 2 and Phase 8 shown in Figure 3 show their compliance below the 250 lb TSP/dy limit, and Figures 2 and 3 are broken down into their respective TSP source by type.

Please review the following ATC application and note any deficiencies to us. All AECS will meet BACT LAER. Air quality and meteorological monitoring will commence 1 year before construction is scheduled to begin. We appreciate your review and assistance.

Sincerely,

Wilson B. Goddard, Ph.D.
Principal

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APPENDIX F

PUBLIC SAFETY/RISK DATA

APPENDIX F1

REVIEW OF APPLICANT PREPARED HEALTH RISK ASSESSMENT

APPENDIX F - PUBLIC SAFETY/RISK DATA

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APPENDIX F1

REVIEW OF APPLICANT PREPARED HEALTH RISK ASSESSMENT

A health risk assessment for the Hidden Valley Project was prepared by the applicant's consultant (Goddard & Goddard, 1991) for submission to the California Department of Health Services (CDHS). The applicant's document, incorporated herein by reference, will be referred to as the HRA. This HRA has been reviewed for purposes of determining whether health risks are likely to be significant under the definition given in Section 4.1.1 of the EIR/EIS. The reader is directed to review the HRA for further information on the analysis.

The HRA addresses both normal operations and upset conditions. Health risks from normal operations are discussed here. Upset risks are discussed in Section 4.1. The HRA includes a project description, an emissions inventory, air dispersion modeling and risk analysis. These topics are discussed below.

The project description contains much of the same information contained in the project description for this EIR. In fact, information included in the applicant's project description has been relied on in developing the EIR Project Description. The important parts of the project description relevant to the health risk assessment are the descriptions of potential toxic pollutant emitting activities. Toxic emitting activities include handling and storage of hazardous materials.

The following CDHS guidelines will be adopted by the facility:

1. Only solid materials resulting from the treatment or clean-up of hazardous wastes will be acceptable;

2. No free liquid hazardous waste will be accepted;

3. Hazardous organic waste will not be acceptable unless stabilized or solidified and encapsulated;

4. Residuals will be kept as dry as possible to prevent the formation of leachate.

F1.1 EMISSIONS

Toxic emissions will result from fugitive dust during handling of contaminated bulk material and from organic emissions at storage areas. Estimates of emissions of contaminated respirable particulate emissions (PM_{10}) from handling activities are given in the HRA in Table 4-1. PM_{10} estimates in the HRA were calculated using equations provided by the U.S. Environmental Protection Agency (EPA, 1990) in its AP-42 publication. However, equations used in some cases have been replaced in the most current version of AP-42. These cases are identified and

discussed below. Handling activities are described below along with the method used to calculate emissions. In some cases, emission estimates are revised as appropriate. Emission estimates in the HRA and the revised estimates are given in Table F1-1.

In the following discussion, assumptions used in the HRA for calculating emissions in Table F1-1 are given along with revised assumptions as appropriate. Unless stated otherwise, emission rates shown are for operational hours only, when practically all emissions will occur. Hidden Valley Resources has committed to meeting all air emission control efficiencies assumed in the HRA.

F1.1.1 Main Unloading Building with Enclosed Air/Dust Cleaning System

Of the total throughput of 450,000 tons/year of hazardous waste residuals accepted at the facility, 80 percent, or 360,000 tons/year, is assumed to be unloaded in the enclosed repository receiving building. As described in the project description, the building will be fully air/dust tight with double entry air locks at entry and exit for both rail and truck traffic. Dust control hoods and covers will be installed at all fugitive dust generation points and will discharge to the air recovery air/dust cleaning system. Discharge air will be cleaned by particulate scrubbing cyclones and a baghouse. The assumption made in the HRA is that the cyclones will remove 96 percent of particulates and the baghouse will remove 99 percent of the remainder. Thus, the combined control efficiency is assumed to be 99.96 percent.

Based on data provided by the California Air Resources Board (CARB, 1987), a high efficiency cyclone should have a removal effectiveness of 95 to 99 percent for particles greater than 2 microns in diameter. The effectiveness drops off substantially for particles of 1 micron or less. However, this does not appear to be a limitation for this analysis because fugitive dust particles are generally larger than 1 micron in size. The same CARB publication indicates an overall baghouse effectiveness of 99.3 to 99.9 percent. Thus, the efficiencies assumed for the HRA appear reasonable. HVR has committed to achieving these efficiencies when in operation.

Assumptions for specific operations within this building are described below.

1. Unloading - As mentioned above, 360,000 tons/year of hazardous materials will be unloaded in the repository building. For purposes of estimating particulate emissions, the HRA assumes a silt content of 5 percent and a moisture content of 20 percent. An indoor ventilation rate of 0.5 mph is also assumed. The equation used for calculating a particulate emission factor was taken from AP-42, Section 11. However, the equation used has been replaced in a revision to AP-42 with one that the EPA considers more accurate (AP-42, page 11.2.3-3, dated 9/88). The revised equation is based on wind speed and moisture content but does not consider silt content. It is acknowledged in the discussion accompanying the equation that silt content is not used and a recommendation is made to reduce the quality rating by one if the silt content for the application of interest falls outside the silt range from which the equation was developed (0.44 to 19 percent). The silt content for this application was 5 percent as mentioned above. Thus, the quality rating of A, which is the highest possible, would be retained. The

TABLE F1-1

EMISSION ESTIMATES OF CONTAMINATED PM_{10}

Residuals Handling Method	Applicant's HRA			As Calculated For EIR	
	Throughput (tons/yr)	Controlled Emission Factor	PM_{10} Emission Rate (lb/hr)	Controlled Emission Factor	PM_{10} Emission Rate (lb/hr)
Enclosed air/dust cleaning system					
(1) Unloading	36,000	1.33E-11 lb/ton	2.30E-9	8.94E-10 lb/ton	1.55E-7
(2) Grinding	180,000	3.60E-6 lb/ton	3.12E-5	3.60E-7 lb/ton	3.12E-5
(3) Decontamination	450,000	0.0 lb/ton	0.0	0.0 lb/ton	0.0
SUBTOTAL	-	-	**3.12E-5**	-	**3.12E-5**
Repository containment structures filling					
Enclosed air/dust tight conveyor unloading:					
(4) Hexagons - enclosed	180,000	0.0 lb/ton	0.0	0.0 lb/ton	0.0
(5) Trapezoids - open	180,000	7.46E-8 lb/ton	6.46E-6	1.27E-5 lb/ton	1.10E-3
Direct Unloading					
(6) Hexagons - enclosed	45,000	7.46E-8 lb/ton	1.61E-6	1.27E-5 lb/ton	2.75E-4
(7) Trapezoids - open	45,000	1.49E-7 lb/ton	3.23E-6	2.54E-5 lb/ton	5.50E-4
Other					
(8) Trapezoid bulk open work area	0.14 acre	0.0435 lb/acre-hr	6.24E-3	0.0435 lb/acre-hr	6.24E-3
(9) Civil activities	0.14 acre	0.0833 lb/acre-hr	1.20E-2	0.0833 lb/acre-hr	1.20E-2
SUBTOTAL	-	-	**1.82E-2**	-	**2.02E-2**
TOTAL	-	-	**1.82E-2**	-	**2.02E-2**

quality rating of the older equation used in the HRA is C. Thus, the newer AP-42 equation is appropriate for this emissions estimate.

The moisture and wind speed factors used appear reasonable and were used for the revised calculation. Both emission factors are shown in Table F1-1. The emission rate, in lb/hr, is also shown in Table F1-1 for both cases.

2. Grinding - The entry labeled Grinding refers to sorted screening and subsequent grinding of large materials deemed too large. According to the project description, grinding will be done to ensure uniform sizing of the waste residuals. Drapers will be used to control emissions to the air inside the enclosed building with a control efficiency of 90 percent. Fugitive dust remaining after control by drapers will still be passed through the cyclone/baghouse system for an additional 99.96 percent control. The HRA calculation assumes that one-half of received material will undergo the sizing and grinding process. Although this is not explicitly stated in the HRA, it is clarified by HVR in subsequent correspondence.

   The emission factor in the HRA is taken from AP-42, Table 8.19.1-1, under primary and secondary crushing. A combined control factor of 99.996 percent was applied to the factor of 0.018 lb/ton to reflect the draper, cyclone and baghouse controls. One-half of the resulting total particulates estimate is assumed to be PM_{10}. All of the assumptions made in the HRA regarding the emission factor appear reasonable.

3. Decontamination - All trucks and railcars will move to decontamination stations upon completion of unloading. The decontamination stations will be fully enclosed air/dust tight double door steam/spray units with air effluent cleaning and water reclamation recovery systems. The assumption is made in the HRA that emissions from this process, if any, will be negligible. Thus, the PM_{10} emission factor was estimated as zero. This assumption appears reasonable given the enclosed building and the use of water spray for cleaning. Therefore, the HRA estimate has been retained for this review.

- Filling of Repository Containment Structures.

  An estimated one-half of the residuals unloaded in the enclosed building will be conveyed to the hexagon containment structures and the other half to the bulk open trapezoid containments (180,000 tons/year each). The conveyor system will be an enclosed system maintained under negative air pressure to prevent fugitive dust emissions. Drapers will be employed at the containment drop points to control PM_{10} emissions by 90 percent. The hexagon containment structures receiving the conveyed material will be enclosed with a portable cover. This cover is indicated on Figure 3-1 of the HRA.

  An estimated 20 percent of delivered residuals will be routed directly to the repository storage facility, bypassing the enclosed unloading building. An estimated one-half of this amount will be routed to the hexagon containment structures while the other half will be routed to the bulk open trapezoid containments (45,000 tons/year each). Emissions at

drop points will be controlled with drapers for a 90 percent control efficiency. Emission calculations are discussed below.

- Conveyed Material

4. Hexagons - enclosed - The HRA assumed that emissions caused by unloading from the enclosed conveyor to the enclosed hexagon storage area would be negligible and a value of zero was assigned. Based on the described procedure, this appears to be a reasonable assumption.

5. Trapezoids - open - Trapezoids filled from the conveying system would not themselves be enclosed. Thus, there is an opportunity for some emissions at the transfer point. The HRA used the same emission factor equation that was used for Activity No. 1 above (unloading in the enclosed building). The updated EPA equation, described under Activity No. 1, has been used for this analysis.

- Direct Unloading

6. Hexagons - Hexagons used for direct unloading apparently will not be enclosed with a portable cover, as the hexagons receiving conveyed material will be. However, drapers will be employed for 90 percent control of fugitive dust. The same emission factor used for Activity No. 1 above is appropriate for this activity and was used for the revised calculation in Table F1-1.

7. Trapezoids - open - Drapers will be employed to control fugitive dust from this activity by 90 percent. The same emission factor equation used for Nos. 5 and 6 above is appropriate for this case. However, two drops will be necessary rather than the single drop for the other activities. Hence, the emission factor has been doubled.

- Other Activities.

Other activities that may generate fugitive dust from hazardous materials brought to the repository would occur at an active and exposed fill area having an extent of approximately 30 ft by 209 ft, according to the description in the HRA. This area would change locations within the trapezoid depending on where filling is occurring. The 30 ft by 209 ft area was estimated based on the amount of space needed for trucks to maneuver.

8. Trapezoid bulk open work area - The emission factor used in the HRA was taken from AP-42 based on an equation which was deleted during a 1988 revision and was not replaced by a substitute equation suitable for this purpose. For this reason, the old equation appears to be the best available and it was retained for

this review. The calculated factor is based on 5 percent silt, 14 days per year with precipitation greater than 0.01 in. and winds greater than 12 mph 3.7 percent of the time. The PM_{10} fraction was assumed to be one-half of total particulates.

The silt content is within the range reported by AP-42 in Table 11.2.3-3 accompanying the equation used. The assumed occurrence of precipitation appears reasonable based on Figure 11.2.1-1 of AP-42. The frequency of winds greater than 12 mph refers to winds at mean pile height. Available wind data from Daggett (California Department of Water Resources, 1978) indicate that winds exceed 21 mph 3.7 percent of the time at 7 to 10 meters above the ground. Daggett data are taken to be reasonably representative of the site. Data from a nearer location were not available. Using the power law equation that describes variation of wind speed with height above the ground (Turner, 1970), and using a power law exponent of 0.2 (representative of average stability conditions), 21 mph at 7 to 10 meters is approximately 12 mph at ground level. Therefore, the 3.7 percent frequency assumption is considered valid. Finally, the assumed PM_{10} fraction is a reasonable assumption for fugitive dust. Therefore, the emission factor used in the HRA is considered reasonable. This factor is an overall average rather than for operational hours only.

9. Civil activities - Civil activities within the 30 ft by 209 ft area described above refers to grading over the area traversed by trucks during unloading operations. The HRA assumes the AP-42 factor of 1.2 tons particulate per month per acre of activity. Although this is a very generalized factor, it appears to be the best available for this type of activity. This factor is an overall average rather than for operational hours only.

The HRA further assumed that PM_{10} comprised one-half of total particulates, a reasonable assumption, and that emissions would be controlled with 95 percent efficiency. The control measures to be used are not mentioned in the HRA. However, based on discussions with the author of the HRA, drapers are assumed for the grading equipment with a control efficiency of 95 percent. As stated previously, the applicant has committed to the control efficiencies in the HRA.

Based on the assumptions discussed above, wind blown dust and grading activities within the 30 ft by 209 ft area would account for 90 percent of total emissions of contaminated dust. The emission estimate for fugitive dust in this review is about 10 percent higher than estimated in the HRA. Thus, the two estimates are in reasonable agreement.

F1.1.2 Toxic Component of Fugitive Emissions

F1.1.2.1 Metals

Having estimated fugitive particulate emissions from contaminated material, it is necessary to estimate the fraction of those emissions containing various toxic compounds. The HRA assumes that 30 percent of bulk solids received are contaminated. This assumption is taken from a permit application for the Kettleman Hills hazardous waste facility operated by Chemical Waste Management (Woodward-Clyde, 1988). Although the actual percentage is unknown, this does not appear to be an unreasonable assumption.

The fractions of various heavy metals in the waste was also taken from the Kettleman Hills report. These fractions were based on waste stream data provided to Woodward-Clyde (1988) by Chemical Waste Management.

Metals fractions and calculated metals emissions rates are shown in Table F1-2 both for the HRA and as estimated for this review. Calculational methods and the differences between results for the HRA and this analysis are discussed below.

In Table F1-2, the "Amount in Bulk Solids" is 30 percent of the "Amount in Contaminated Waste" since contaminated wastes are assumed to be 30 percent of the bulk solids material. The baghouse emission rate of a compound is the bulk solids fraction (percent divided by 100) times the baghouse PM_{10} emission rate from Table F1-1 (converted to grams per second) . Likewise, the containment emission rate of a compound is the bulk solids fraction times the containment area PM_{10} emission rate (in grams per second) from Table F1-1. The value for cadmium should have been 0.0009 pct. instead of 0.00009 pct. (Appendix A of the HRA). For copper, lead and mercury, the maximum allowable concentration for land disposal residuals, based on information presented in Table 2-1 of the HRA, was assumed for the HRA analysis and for this review. Dioxins and furans were not included in the HRA estimate. The regulatory limit is 1 ppb (10^{-7} percent) for each of these carcinogenic compounds. For purposes of this estimate, the total dioxin/furan concentration was assumed to be 1 ppb, expressed as TCDD, the most carcinogenic type of dioxin.

In summary, baghouse emissions for this estimate are the same as for the HRA. Containment emissions are slightly higher because of the slightly higher estimate for contaminated fugitive dust. Dioxins and furans have been added to the list of toxic emissions.

F1.1.2.2 Organics

<u>VOC Contaminated Particulates</u>

Volatile organic compounds (VOC) are assumed in the HRA to comprise one-half of the waste content in the high VOC bulk solids (i.e one-half of 30 percent, or 15 percent). The high VOC bulk solids are the 10 percent directly unloaded in the hexagonal containment areas (Item 6 in Table F1-1). The assumed 15 percent value is again taken from the Kettleman Hills study. The

TABLE F1-2

RESIDUAL HEAVY METALS AND TCDD CONTENT AND ESTIMATED FUGITIVE EMISSION RATES

Metal	Amount In Waste (wt.pct.)[a]	HRA Calculations			EIR Calculations		
		Bulk Solids (wt.pct.)	Baghouse (g/sec)	Containment (g/sec)	Bulk Solids (wt.pct.)	Baghouse (g/sec)	Containment (g/sec)
Cadmium[c]	0.0030	0.00009	3.56E-12	2.07E-9	0.0009	3.56E-11	2.29E-8
Chromium[c]	0.0110	0.0033	1.31E-10	7.59E-8	0.0033	1.31E-10	8.40E-8
Copper	0.0900	0.0025[b]	9.82E-11	5.75E-8	0.0025[b]	9.82E-11	6.36E-8
Iron	0.8000	0.2400	9.50E-9	5.52E-6	0.2400	9.50E-9	6.11E-6
Lead[c]	0.3100	0.0050[b]	1.93E-10	1.15E-7	0.0050[b]	1.93E-10	1.27E-7
Mercury[c]	0.024	2.00E-5[b]	7.86E-13	4.60E-10	2.00E-5[b]	7.86E-13	5.09E-10
Nickel	0.006	0.0018	7.13E-11	4.14E-8	0.0018	7.13E-11	4.58E-8
Tungsten	0.048	0.0144	5.70E-10	3.31E-7	0.0144	5.70E-10	3.67E-7
TCDD[c]	-	-	-	-	1.00E-7	3.93E-15	2.55E-12

[a] Woodward-Clyde, 1988.
[b] Regulatory limit
[c] Known or suspected carcinogen

10 percent high VOC portion is estimated for the HVR project but no support for this assumption is provided. Also, no emission estimates are made for low VOC materials. The distribution of various organics, toxic or otherwise, within the assumed total VOCs was taken from the Kettleman Hills study (Woodward-Clyde, 1988). This distribution was derived by Woodward-Clyde based on fractions of various waste classifications supplied by Chemical Waste Management.

VOC emissions from direct unloading into hexagonal containments are taken in the HRA as the VOC fraction times the PM_{10} emission rate. Thus, these emissions are assumed to be in VOC contaminated particulates. These emission estimates are shown in Table 4-4 of the HRA (middle column). Since no other data were available, the VOC contaminated particulate emissions estimated in the HRA have been retained for this review. Uncertainty in emission estimates is discussed later.

Evaporative Organic Emissions

Evaporative organic emissions estimates in the HRA are shown in Table 4-6 of that document. These emissions are divided into emissions from unloading areas and emissions from storage areas. Emissions in unloading areas (i.e. at a hexagon that is being filled) will be controlled to 95 percent efficiency by a vapor recovery system. During the interim, when filling is not in progress but filling will continue, the high VOC containment storage areas will use chiller/condensers maintained at 38°F followed by an activated carbon bed adsorber system. The control efficiency of this system is given as 99.5 percent. After filling of a hexagon is completed, it will be capped and sealed with no further emissions to the air.

Emissions from unloading and storage were calculated in the HRA from a formula proposed by Woodward-Clyde (1988) in the Kettleman Hills report. The formula is derived from the Fickian diffusion equation and was applied to hazardous bulk materials by Woodward-Clyde as well as in the HRA (see p. 5-19 of HRA, Appendix A). Based on the formula, emissions are proportional to the exposed area and inversely proportional to the depth of the pile. Although emissions can reasonably be assumed to be proportional to the exposed area, it is not reasonable to assume that they are inversely proportional to depth. That is, it does not make sense that emissions will decrease as the height of the pile increases. In the case of the 50 ft deep hexagon containments, calculated emissions would be fifty times greater if the depth was only one foot. A discussion of this equation is given by EPA (1989) although it is attributed to Thibodeaux. The depth in the denominator is given as the depth of the soil fill cover, not the depth of the contaminated soil.

A more appropriate formula for calculating VOC emissions could not be identified. Therefore, no attempt has been made to recalculate VOC emissions. Uncertainty with respect to this calculation is discussed later in conjunction with risk estimates.

F1.2 DISPERSION MODELING

The basic procedure for estimating health risks is to calculate concentrations in the air due to facility emissions of toxic compounds and then to estimate risk based on these concentrations. Ambient concentrations are calculated with a computerized dispersion model. The ambient concentration becomes lower at greater distances from the sources. Ambient concentrations are generally determined at locations near the source and at certain sensitive receptors or population centers. Risk is estimated in two different ways, depending on whether the risk being evaluated is cancer or non-cancer related. Health risk assessment procedures are described by CAPCOA (1991).

For cancer, risk from inhalation of toxic compounds is determined by multiplying the long-term average (generally annual) concentration by a unit risk factor established by the California Department of Health Services or the U.S. EPA. The resulting product is the projected risk of a person contracting cancer from the chemical in question if the person is constantly exposed to the concentration for a full 70-year lifetime. Risk is proportionately less for a shorter exposure period. Risk from other exposure pathways is also calculated for certain compounds, generally those that are subject to deposition onto the ground. This calculation involves various assumptions about contamination of farm animals used for meat and of vegetables and fruits, as well as absorption through the skin. Overall cancer risk is determined by adding the individual risks associated with each chemical. This risk is location dependent to the same extent that ambient concentrations are location dependent.

For non-cancer risk, the ambient concentration is divided by the threshold specified for the chemical in question. This results in a normalized hazard index. If the hazard index is greater than one, the exposure is determined to be significant. Different thresholds exist for acute (1-hour) and chronic (annual) exposures. The hazard indices for each chemical for which thresholds are specified are added together to determine whether there is a significant risk from exposure to all chemicals. A hazard index of one is used for this determination.

The basic procedure described above was followed in the HRA. Ambient concentrations were calculated in two ways. The first was with a screening dispersion model (the SCREEN Model; EPA, 1988). This model makes assumptions about worst-case meteorological conditions important for dispersion calculations but does not consider actual conditions. The use of worst-case assumptions required of the SCREEN model tends to overstate actual impacts. The use of actual data is preferable when representative data are available. The second method was to use the ISCST model, an EPA Guideline Model (EPA, 1987), with actual meteorological data. The most representative meteorological data available was from Daggett, approximately twenty miles to the west of the proposed facility. This data set is taken to be reasonably representative of the project area for purposes of calculating annual average concentrations.

The HRA considered only specific receptors either within or at the project boundary or at residences or work places. Receptors for model impact calculations were placed downwind at the following distances from the source:

Distance	Purpose
100 meter	Onsite impacts
2,000 feet	Fenceline
2,400 feet	Nearest boundary
4.8 miles	Closest rural residence
7.0 miles	Hector Santa Fe railroad siding
8.2 miles	Rural residence near Hector
10.5 miles	Rural resident near Pisgah Crater and Hector Mine.
17.0 miles	Community of Newberry Springs, and Community of Ludlow.

Although these distances were determined for specific directions from the source, impacts calculated at each distance can be applied to all directions because the screening analysis is not direction specific.

The HRA use of the SCREEN model included a full array of default meteorological conditions, including worst-case conditions. The meteorological array contains all atmospheric stability conditions, from Class A (extremely unstable) to Class F (very stable), and a range of wind speeds appropriate for each stability class. Classes A through C (unstable) are normally associated with daytime conditions. Classes E and F (stable) are normally associated with nighttime conditions. Class D (neutral) is associated with both day and night conditions. The SCREEN model calculates impacts for each stability/wind speed class and determines the maximum concentration at each receptor from among these categories. Different stability/wind speed combinations may be associated with each receptor. Since the HVR facility will only operate during the day time, it is appropriate to restrict the analysis to stability Classes A through D.

The HRA application of the SCREEN model assumed a point source for both the baghouse and containment area emissions. A point source is a source where emissions are released from a single point, such as a stack. These two sources were modeled with two separate runs. Both sources were assumed to be elevated 10 meters (33 ft) above the ground. Receptors for both runs were also assumed to be elevated 10 meters above the ground. For the containment area emissions, most of which will occur over an area of approximately 30 ft by 209 ft, an area source would be more appropriate than a point source. An area source is a source with a finite width.

SCREEN calculated impacts were multiplied by the California Air Resources Board recommended factor of 0.1 to obtain screening estimates of annual concentrations. A unit emission rate of 1 gram per second was used to obtain a normalized concentration that could later be adjusted for emission rates of various toxics for assessing health risks.

As mentioned previously, use of the ISCST model with representative hourly meteorological data would be preferable for calculating realistic impacts. Annual impacts calculated by this approach would tend to be lower than by the screening approach used with the SCREEN model. One shortcoming of the ISCST analysis in the HRA is that fenceline concentrations were only predicted in one direction (due south of the emission sources). For a risk analysis with actual meteorological data, such as with this application of ISCST, receptors in all directions should be considered. A review of the Daggett meteorological data (HRA Appendix E) reveals that northerly winds (towards the south) are very infrequent compared to prevailing westerly winds. Therefore, a higher impact may be found to the east of the source area, even though the distance to the fenceline may be greater. For the purposes of an Environmental Impact Report, all directions should be considered. Since the ISCST analysis for the HRA considered only a limited number of receptors, its results were not considered further for this review.

In order to resolve the items discussed above relative to the SCREEN model, the model was rerun with the following differences. The model was only rerun with the containment area emissions because the estimated baghouse emissions were negligible in comparison.

1. The containment area was treated as an square area source with a width of 79 feet (24 meters). This represents the approximate area covered by 30 ft by 209 ft, the unloading area where most containment area emissions would occur.

2. The release height was ground level to be consistent with the actual source.

3. Receptor heights were 1.5 meters above the ground (i.e., nose height).

4. Stability classes were limited to A through D to represent daytime conditions.

The following results obtained by the additional SCREEN analysis are compared to the results presented in the HRA. All maximum impacts shown below are associated with stability Class D and a wind speed of 1 meter per second. Annual impacts are equal to maximum SCREEN one-hour impacts multiplied by 0.1 based on an emission rate of 1 g/sec.

Receptor	Distance	Annual Impacts HRA Calc.	$\mu g/m^3$ Revised Calc.
On-site	328 feet	139	497
Fence Line	2,000 feet	89.5	31.0
Project Boundary	2,400 feet	74.8	23.0
Closest Residence	4.8 miles	3.45	0.63
Hector Santa Fe	7.0 miles	2.12	0.36
Pisgah res. & Hector mine	10.5 miles	1.27	0.20
Newberry Springs & Ludlow	17.0 miles	0.72	0.11

With the exception of the onsite receptor, all recalculated impacts were less than those predicted in the HRA. However, an examination of the HRA onsite receptor results indicates that impact was calculated for stability Class C while the others were calculated with class F, which is associated with much less dispersion. An additional run was made with the SCREEN model using the HRA input parameters, except that the source height was changed to zero and the receptor height was changed to 1.5 m. The annual impact at the onsite receptor became 2732 $\mu g/m^3$ and was associated with Class F conditions. The use of Class C in the HRA run, instead of Class F, is related to an error in the SCREEN program in which the plume height above ground level is set to zero for the case modeled, even though the height should have been set by the model to 10 meters (i.e., stack height). Thus, without the error in SCREEN, the HRA result would have been much higher at the onsite receptor than shown. The error has been reported to EPA who has acknowledged it and will take steps to correct it (EPA, personal communication).

F1.3 HEALTH RISK ASSESSMENT

Cancer risk was calculated for the HRA using the HRA Model developed by the CARB. This model is simply an automated version of the cancer risk equations recommended by the California Air Pollution Control Officer's Association (CAPCOA, 1991)) for calculating risk for the Air Toxics "Hot Spots" Reporting Act of 1987 (AB2588). The model requires the user to input an annual normalized concentration, based on 1 g/sec emissions, and estimated emission rates for each toxic pollutant. Model output includes concentrations for each toxic pollutant and total cancer risk, based on lifetime exposure to all carcinogens in the emissions inventory. Cancer risk is given for known carcinogens and, separately, for suspected carcinogens. The known carcinogens must be analyzed under AB2588. The suspected carcinogens may need to be analyzed, depending on the local Air Pollution Control District (APCD). The HRA analysis showed risks for the known carcinogens as well as for suspected carcinogens.

Based on the SCREEN and HRA models, the cancer risk at the fenceline was predicted in the HRA to be 2.4 in 10 million for the CDHS/EPA carcinogens and an additional 6.6 in 10 million for the additional AB2588 chemicals. Thus, the total fenceline screening risk calculated for the HRA was 9.0 in 10 million. The presence of added risk for the AB2588 chemicals is uncertain and may not exist since these are only suspected carcinogens. The calculated risk was significantly less at receptors farther away from the facility. For example, at the nearest residence, 4.8 miles to the northwest, the calculated risks based on the SCREEN model were 4.2 in 100 million and 1.2 in 10 million for the EPA/DRS and AB2588 chemicals, respectively.

Calculated risks at the fenceline are based on constant exposure by worker for 40 hours per week over a 70-year lifetime. Calculated risk at the nearest residence is based on 24 hour per day exposure for 70 years. However, for comparison to Proposition 65 criteria for significance, which are the criteria used for determining the health risk significance of the proposed project, all risks should be based on constant exposure. (California Code of Regulations 22-12703 states as follows: "For chemicals assessed in accordance with this section, the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure at the level in question...").

Cancer risk estimates were recalculated using the HRA Model discussed above with revised SCREEN model results. The results of the HRA model are directly proportional to the normalized concentration that was calculated at each of the various receptors by the SCREEN model. For this reason, the HRA Model was run once for the nearest receptor and the results were adjusted for each of the other receptors.

Results of the revised HRA Model run, including risks at all receptors considered, are shown in Table F1-3. The printout from the model run is reproduced in Appendix F1. Table F1-3 indicates each receptor and downwind distance, along with the normalized concentration (Chi/Q). The column titled, "Excess Cancer Risk" refers to the known carcinogens analyzed by the HRA Model. The column titled, "Additional Screening Risk" refers to the additional suspected carcinogens that may require analysis under AB2588, depending on the discretion of the local Air Pollution Control District. The "Total Screening Risk" is the sum of the Excess Cancer and Additional Screening risks.

When only the known carcinogens are included, and based on the emissions estimates discussed above, excess cancer risk is less than the one in 100,000 (1.0E-5) significance threshold at all receptors, including the onsite receptor. When the suspected carcinogens are added, the total risk exceeds the significance threshold by 50 percent at the onsite receptor but is well below the threshold at all other receptors. A sensitivity analysis of risk versus downwind distance indicated that the total screening risk would be less than one in 100,000 at 135 meters downwind from the sources. At 2,000 ft. downwind (610 meters), the total screening risk is only 9 percent of the one in 100,000 significance level.

The risk from known carcinogens is mostly due to hexavalent chromium (82 pct.) with secondary contributions by benzene (6 pct.), dioxins (6 pct.), and carbon tetrachloride (3 pct.).

TABLE F1-3

HIDDEN VALLEY RESOURCES
SCREENING ANAYLSIS OF LIFETIME EXCESS CANCER RISK

Receptor Location	Downwind Distance	CHI/Q	Excess Cancer Risk	Additional Screening Risk	Total Screening Risk
On-Site	100 m	497	4.5E-06	1.0E-05	1.5E-05
HVR Fence Line	2,000 ft	31	2.8E-07	6.2E-07	9.0E-07
Nearest Boundary	2,400 ft	23	2.1E-07	4.6E-07	6.7E-07
Closest Residence	4.8 mi	0.63	5.7E-09	1.3E-08	1.8E-08
Santa Fe Siding	7.0 mi	0.36	3.3E-09	7.2E-09	1.1E-08
Hector Residence	8.2 mi	0.29	2.6E-09	5.8E-09	8.4E-09
Pisgah Crater Residence	10.5 mi	0.20	1.8E-09	4.0E-09	5.8E-09
Hector Mine	10.5 mi	0.20	1.8E-09	4.0E-09	5.8E-09
Newberry Springs	17.0 mi	0.11	9.6E-10	2.1E-09	3.1E-09
Ludlow	17.0 mi	0.11	9.6E-10	2.1E-09	3.1E-09

The risk from the additional AB2588 chemicals was almost entirely due to 2-nitropropane. The large majority of estimated chromium emissions (90 percent) would occur at the containment unloading area. Thus, the containment unloading area is the primary source of risk for known carcinogens. Emissions of 2-nitropropane would occur with gaseous emissions associated with unloading and storage of clean-up hazardous waste bulk solids. As mentioned previously, there is a good deal of uncertainty associated with estimates of these gaseous emissions.

Also, maximum concentrations of all chemicals, as shown in the HRA Model printout in Appendix F1, are many orders of magnitude below the chronic and acute non-cancer acceptable exposure levels listed in Table 5-5 of the HRA. Consequently, the hazard index would be much less than one, the significance threshold for assessing non-cancer risks. Revisions made for this review would not affect this conclusion. Therefore, non-cancer risk from facility operation is found to be insignificant.

F1.4 SUMMARY AND CONCLUSIONS

A health risk assessment (HRA) for the proposed HVR hazardous waste repository was prepared by the applicant's consultant. The HRA consists of waste characterization, emissions calculations, dispersion modeling and risk calculations. The applicant's HRA concluded that all risks associated with operation of the proposed facility would be within acceptable limits. Acceptable limits are defined as less than one in 100,000 for cancer risk and a hazard index less than one for non-cancer risk (both acute and chronic).

The purpose of this review was to independently assess the adequacy of the applicant-submitted Health Risk Assessment for purposes of determining significance under CEQA. There were some disagreements in calculations used in the HRA. Based on these disagreements, emissions, dispersion, and health risks were recalculated. All cancer risks were found to be below the significant risk level of one in 100,000 beyond 135 meters from the source. Cancer risk was calculated to be only 9 percent of the significance level at 2,000 ft from the sources. Although uncertainty exists in the emissions calculations, especially for gaseous emissions, a 2,000 ft buffer zone would allow adequate protection against this uncertainty. This conclusion is bolstered by the fact that the screening dispersion calculations are expected to be overpredictive for annual averages.

APPENDIX F2

DETAILED PUBLIC SAFETY AND HEALTH RISK ANALYSIS

APPENDIX F2 - DETAILED PUBLIC SAFETY AND HEALTH RISK ANALYSIS

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APPENDIX F2 - DETAILED PUBLIC SAFETY AND HEALTH RISK ANALYSIS

F2.1 DETERMINATION OF IMPACT SIGNIFICANCE CRITERIA

The potential impact to public safety has been separated into two major areas in this analysis: 1) potential accidents from residuals transport and 2) normal project operations. First, the possible impacts to the public from potential accidents associated with the proposed project were evaluated. In this case, an impact does not occur unless there is an accident. The potential consequence (harm or damage from an accident) is separated into five categories, defined in Table F2-1. The categories range from negligible to disastrous consequences. Impact significance is considered to be both a function of the potential harm or damage possible should an accident occur and the probability of an accident occurring. Frequency of occurrence is also separated into five categories ranging from virtually impossible to virtually certain. These categories are defined in Table F2-2.

A significant public safety impact is then defined as:

- An accident whose frequency of occurrence lies between "virtually certain" and "rare" (i.e. has a probability of occurrence greater than 10^{-6} per year) **and** which could cause loss of life to members of the public (i.e. categorized as severe or disastrous).

The second potential public safety impact results from normal operations of the project. Health risks associated with normal operations are separated into three categories of significance: 1) Chronic - carcinogenic; 2) Chronic - toxicity; and, 3) Acute - toxicity. Health risks were considered significant as defined below.

- Carcinogenic risk were considered significant if the maximum cancer risk to an individual would exceed one in one hundred thousand based on the individual being continually exposed to the normal operating emissions of the facility for a lifetime of 70 years at or beyond the property line. This criterion is based on the Proposition 65 threshold of one in one hundred thousand for cancer risk.

- The chronic-toxicity and acute-toxicity exposures were considered significant if the normal plant emission concentrations at the facility boundary exceed the chronic or acute non-cancer acceptable exposure levels (NAELs) for inhalation. The NAELs are defined in CAPCOA (1991). This determination was be made based on the hazard index approach. Using this approach, the concentration for each toxic pollutant is divided by its respective NAEL to determine a hazard index. The hazard indices for each pollutant are added together. A total hazard index greater than one indicates a significant impact at the location for which it was calculated.

The health risk assessment for the proposed project has been prepared by the applicant's consultant (Goddard & Goddard, 1991) and is incorporated herein by reference.

Table F2-1

SEVERITY OF CONSEQUENCE DEFINITIONS

Category	Description
Negligible	No effect on public health or safety; no facility personnel injuries; no damage to facilities.
Minor	No serious injuries or loss of life; little damage to facilities, no out-of-service time.
Major	Possible serious injuries or loss of life to some working facility-related personnel, but no injury or loss of life to public.
Severe	Injury or loss of life to small number of pubic, or injuries or loss of life to substantial number of facility personnel; substantial damage to surrounding facilities.
Disastrous	Substantial loss of life to public.
References: Santa Barbara County, 1990 and Prima Tech, 1990.	

Table F2-2

FREQUENCY OF OCCURRENCE DEFINITIONS

Category	Frequency	Description
Virtually Impossible	10^{-6}/year Or only once in more than 1,000,000 years	This type of event has almost never occurred, but it conceivably could.
Rare	$> 10^{-6}$/year $< 10^{-4}$/year Or once in 10,000 to 1,000,000 years	Such events have occurred on a worldwide basis but only a few times.
Unlikely	$> 10^{-4}$/year $< 10^{-2}$/year Or once in 100 to 10,000 years	Accident occurs, but it is not likely here within project life.
Likely	$> 10^{-2}$/year < 1/year Or once in one to 100 years	Likely to occur during the project lifetime.
Virtually Certain	> 1/year Or more than once per year.	Can be expected to occur more than once a year, on the average.
References: Santa Barbara County, 1990 and Prima Tech, 1990.		

F2.2 PROPOSED ACTION

F2.2.1 Impacts

F2.2.1.1 Initial Construction Activity

Potential public safety risks should be minimal during construction. The traffic generated by construction vehicles and commuting employees would slightly increase traffic on Interstate 40, which would slightly increase the possibility of a vehicle accident, but this would not be significant. Likewise, equipment associated with the construction of the access road would present a slight hazard to off-road vehicles, but again, this would be insignificant. Except for possibly some petroleum products used for fuel, hazardous materials should not be present during the construction phase.

Also, because all construction (Phases 1 through 5) is estimated to take approximately 9 months, and because the only potential emissions during this time would be engine exhaust and dust, there should not be a chronic or acute health hazard to the public or the workers.

F2.2.1.2 Potential for Accidents During Facility Operation

The following types of accidents resulting in potential public safety impacts could be associated with the operation of the proposed project.

- Accidents involving the transportation of hazardous material by truck.
- Accidents involving the transportation of hazardous material by train.
- Hazardous material handling accident at the HVR site.
- Hazard of site to recreation visitors.

Each is discussed below.

Accidents Involving the Transportation of Hazardous Material by Truck

Accident Probability Baseline

This accident type is probably the most visible. Trucks carrying hazardous materials can and have been involved in accidents where hazardous materials have been released.

Trucks would transport the hazardous waste residuals from waste generators, treatment facilities, and cleanup sites located throughout Southern California. As described earlier in this section, the wastes to be transported would be closely regulated and would not include liquid, explosive, ignitable, reactive, gaseous, or nuclear material. The waste could be shipped in a variety of

forms including bulk, blocks, bails, and drums (barrels). The waste would be pretreated and chemically analyzed before transport. As stated in Section 3.1.1.2, manifests are required for the shipment of all hazardous materials. Because of this control and treatment the waste materials would not normally be expected to create a hazard should they be spilled. Possible exceptions, to this would be if the material were to become saturated with diesel fuel from the accident and catch fire or the material were to become wet from rain and runoff into water sources.

The major truck routes to the proposed repository would be I-15 from the Los Angeles area to Barstow and SR-58 from the Bakersfield area to Barstow. From Barstow the trucks would follow I-40 to the Hector offramp and then the new road to the repository.

The probability of an accident and release has been examined in several ways. First, the probability of a truck accident on I-15, I-40, and SR-58 was estimated based on historical data for those roads. Table F2-3 summarizes the volume of truck traffic, number of accidents, and probability of an accident based on the historical data. Only two of 542 truck accidents involved trucks carrying hazardous materials, however, it is unknown how many of the total truck trips involved trucks carrying hazardous materials. Since the transportation of hazardous materials by trucks is more closely regulated and scrutinized, it is felt that the probability of an accident involving a truck carrying hazardous materials should be somewhat less than the values presented in the table for all trucks.

Second, based on an analysis by the Department of Transportation (DOT) Office of Hazardous Materials Transportation, Glickman (1988), as adjusted to eliminate tank trucks (no hazards materials would be shipped to the site via tank truck) the probability of a truck accident resulting in a release of hazardous materials is 4.6×10^{-8} per mile traveled for trucks for-hire, and 4.7×10^{-7} per mile traveled for private trucks. The probability of a significant spill (i.e., one resulting in a release above 5 gallons or 40 pounds) is estimated as 7.8×10^{-7} for trucks for-hire and 2.4×10^{-7} for private trucks.

Saccomanno, et al (1989) analyzed truck accident data in the Province of Ontario, Canada. Table F2-4 summarizes the results of that study. The Ontario data is important in that it shows that accident rates are different for loaded and empty trucks, for different type roads, and for roads with different volumes of traffic. Note that accident rates for high volume roads are roughly double those for low volume roads and accident rates for empty trucks are double those for loaded trucks. The probability estimates for Ontario are roughly the same order of magnitude as those for the road segments for the proposed action.

Harwood, Russel and Vinter (1989) analyzed DOT data on the highway transportation of hazardous materials. Their analysis included estimating the probability of release given there is an accident. The study estimated that approximately 99 percent of fatalities and injuries in accidents involving trucks carrying hazardous materials result from the physical collision itself, rather than the hazardous materials being transported. It also estimated that 13 to 15 percent of accidents involving hazardous material-carrying trucks result in a hazmat release. The probability of a spill for solid material being transported in bulk is estimated to be 30 percent accident as a function of cargo type.

Table F2-3

HISTORICAL TRUCK ACCIDENT DATA

Highway	Length (miles)	Annual Average Daily Truck Traffic[a]	No. of Truck Accidents Between 7/1/87 & 6/30/90[b]	Annual Probability of Accident Per Truck Trip	Annual Probability of Truck Accident Per Mile
I-15	74.4	11,566[c]	265	2.1×10^{-5}	2.8×10^{-7}
I-40	31	5,681[d]	31	5.0×10^{-6}	1.6×10^{-7}
SR-58	155	3,876[e]	246	5.8×10^{-5}	3.7×10^{-7}
Average				7.9×10^{-5}	3.0×10^{-7}[f]

[a] California Department of Transportation, September 1990, 1989 Annual Average Daily Truck Traffic on the California State Highway System.
[b] Personal Communications, Duane Hawkes, California Department of Transportation.
[c] Weighted average from I-10 to I-40.
[d] Weighted average from I-15 to Hector Road
[e] Weighted average from SR-99 to I-4
[f] Weighted average calculated as follows: $[(2.8 \times 10^{-7}) \times 74.4 \times 11.566 + (1.6 \times 10^{-7}) \times 31 \times 5,681 + (3.7 \times 10^{-7}) \times 155 \times 3,876] + [74.4 \times 11,566 + 31 \times 5,681 + 155 \times 3,876]$

Table F2-4

TRUCK ACCIDENT RATES

Truck Type	Load	Link Accidents[1] (accident rates per million truck-miles)				Non-Link Accidents (average annual accidents per million truck-miles)
		Freeway		Non-Freeway		
		High Volume >15000 AADT	Low Volume <15000 AADT	High Volume >15000 AADT	Low Volume <15000 AADT	
Truck	Empty	3.96	1.71	3.04	1.79	0.63
	Loaded	1.92	1.00	0.35	1.42	0.31
Truck and Trailer	Empty	0.34	0.14	0.43	0.76	0.13
	Loaded	1.22	0.13	0.34	0.58	0.13
Tractor	Empty	2.46	0.55	3.77	2.32	0.69
	Loaded	1.22	0.55	1.75	1.09	0.34
Tractor and Trailer	Empty	1.67	0.85	2.53	1.42	0.21
	Loaded	1.00	0.52	1.42	0.81	0.24
Tractor and Two Trailers	Empty	0.71	0.13	0.63	0.35	0.23
	Loaded	1.16	0.71	3.30	1.96	0.26

Source: Saccomanno, Shortreed, et al., 1989, Comparison of Risk Measures for the Transport of Dangerous Commodities by Truck and Rail

Notes: [1]Link Accidents are those on the road not involving ramps, intersections, railroad crossings, underpasses or overpasses, etc.

Project Related Accident Probability

Assuming that the probability of an accident for a truck is approximately 4.4×10^{-5} per trip (the average annual probability per trip of the I-15 and SR-58 routes to Hector from Table F2-3; $[(2.1 \times 10^{-5} + 5.0 \times 10^{-6}) + (5.8 \times 10^{-5} + 5.0 \times 10^{-6})] \div 2$, the annual probability of an accident for a truck carrying hazardous material to the proposed project would be 40 percent during the first several years prior to the use of trains $[1-(1\ 1.4 \times 10^{-5})^{45 \times 260}$ where 45 is the number of truck trips where per day and 260 is the number of days trucks will operate]. Assuming that the probability of a release is 30 percent given there is an accident, results in an annual probability of a release of 14 percent from the trucking of the hazardous materials $[1-(1-.3 \times 4.4 \times 10^{-5})^{45 \times 260}]$. These probabilities would be reduced to 25 percent for an accident and 8 percent for a release from trucking after rail transport is begun. These probabilities are estimates at best, however, they do show that the probability of a truck accident with a spill should be categorized as "likely" in accordance with Table F2-2 (i.e., the annual probability of a truck accident with a spill is between once in one year and once in 100 years). While spills are "likely" to occur during the project's lifetime, the second factor in determining significance, the public safety risk, is addressed below.

Public Safety Risk

The second aspect of the potential public safety risk is the consequence of a truck accident. First, a truck accident can result in a fatality from the accident itself and not from the hazardous materials. As stated above, this is the case approximately 99 percent of the time. Harwood, et al. (1989) estimates that 5.7 percent of truck accidents result in one or more fatalities. Thus, the annual probability of a fatal accident involving trucks carrying hazardous residual materials to the site is estimated to be 2.9 percent $[1-(1-.057 \times 4.4 \times 10^{-5})^{45 \times 260}]$. No estimates could be found on the percentage of driver deaths versus deaths of members of the public.

Due to the nature of the hazardous residual materials being transported, the potential for injuries or fatalities from the release of the material would be almost nonexistent. Some material could contain small amounts of solvents and other materials which could produce toxic vapors, however, these constituents would be in such small quantities that they would pose no immediate hazard. Goddard (1991) estimates that the total volatile organic compound (VOC) emission from an accidental spill from a truck would be 0.781 g/sec. He assumed 90 percent VOC control with the application of foam. Without the foam application, the emission rate would be 7.81 g/sec. which is considered to be a conservative estimate. Even if all of this emission was assumed to be the most toxic of the solvents there would be no immediate danger to members of the public. This was established using a Gaussian model and treating the release as an area source.

Although none of the waste materials to be transported are ignitable, it is possible that fuel from the truck hauling the materials could spill out on and around the residual waste material and ignite. This could possibly cause some of the waste residual materials to burn and could heat the material, potentially increasing the emission rates of the VOCs. It is extremely difficult to predict the exact consequence of such a fire, however, it is not likely that an extremely

dangerous situation would be created. First, the amount of hazardous materials is low. Second, the fire may actually consume or destroy some of the hazardous material. The fire could potentially create some hazardous by-products (gases) during the combustion process. In most cases these gases would be hot and rise into the air. An adverse but not significant impact could result from such an event.

In addition, it is possible that dust and particulate matter could become airborne in the event of a spill, especially during very windy conditions. The waste material containing heavy metals would generally be in the form of cement or aggregate matrices and thus very little of the material should become airborne. Likewise, the sludges, slurries, and contaminated soil should not have a high dust content. Lead is the only heavy metal for which an acute inhalation exposure level has been established. CAPCOA, 1990 has set the level at 1.5 $\mu g/m^3$. Using the estimated spill emission rate of 8.50 x 10^{-6} g/sec for an uncontrolled spill from a truck (Goddard, 1991), the highest concentrations of lead under the various meteorological conditions at 20m and 100m were estimated to be 0.9 $\mu g/m^3$ and 0.15 $\mu g/m^3$ respectively using the SCREEN model. These are below the established acute limit for lead.

A release of hazardous residual materials during a heavy rain could result in some runoff of the material. This would complicate cleanup but should not pose an acute health impact. Because the material would be treated/stabilized in accordance with EPA and DHS standards, very little hazardous materials could leach out from the rain. Rain would also decrease the potential for dust and fire.

It is also possible that multiple containers could be ruptured as a result of an accident causing different waste types to come into contact with one another. Since these materials have been treated, this mixing of products should not present a hazard. If the different waste types were to become wet due to rain or getting into surface water the material could become more intermixed. Again, because these materials have been pretreated to meet stringent standards regarding leaching, thjis intermixing should not cause the materials to react with one another causing a fire, explosion, or release of the toxic gas. The material could, however, contaminate the water (see Section 4.3).

In the unlikely event that members of the public come into direct contact with a release of residual material, no long-term health effects would result. It is possible that some skin irritation could occur, however, because of the low concentrations of the hazardous residual materials, no serious injuries would be expected.

Thus while the probability of a spill is likely to occur during the project's operational lifetime, the public safety risk is minor to negligible, and no significant impact results.

Spill Responsibility

The first response from a spill would come from the driver of the vehicle if he or she were able. The driver would be fully trained on what actions to take and whom to notify in the event of an accident. If the vehicle and/or material were on the roadway, the driver would place markers

and/or flares to warn other motorists. The Inland Division of the CHP would be responsible for managing the response to a hazardous material accident occurring on any federal or state highways. This would include I-15, I-40, and SR-58. The CHP would be notified by the driver or other individual. Dialing 911 would cause the CHP to be notified. Once on scene, the CHP would oversee the response activity. If there were a release of hazardous material, the San Bernardino County Environmental Health Services Department would be notified. They would respond with personnel as appropriate.

Since the material probably would not present an immediate danger to the public, the CHP would leave it up to the driver/truck company to respond to and clean up the spill. The truck company would either clean up the spill themselves, if they were licensed to do so, or call a licensed firm to do so. The CHP and County personnel would monitor the cleanup operations to ensure that they are done properly. In most cases the material would be cleaned up with front loaders and trucks, with the material then taken on to HVR. If adjacent soil is contaminated, it may also have to be hauled away. Adjacent soil will be analyzed to make sure it is not contaminated.

The County Fire Department would also be notified and respond if there were a fire or injuries or if there were the potential for such. County Fire Department personnel receive training in responding to hazardous materials releases and fires. The local fire authority has primary responsibility for accident response on local roads, however, the nearest San Bernardino County Fire Department/CDF station is located in Newberry Springs approximately 13 miles west of Hector Road.

Accidents Involving the Transportation of Hazardous Material by Train

Accident Probability Baseline

As with trucks, it is possible for trains containing hazardous materials to be involved in accidents. For the most part, the rail line from the Los Angeles area is away from the freeway and other roads and thus a spill should be more isolated from the public, especially other traffic. On the other hand, a train car holds more than a truck and a train may pull more than one car of hazardous waste at one time. No statistical data was available on accidents for the AT&SF that would be utilized to transport hazardous materials to the Hector siding. Glickman (1988), based on DOT's Office of Hazardous Materials Transportation data base, estimates that the probability of a rail accident with a release of hazardous material is 1.5×10^{-6} per mile per car. If tank cars are eliminated from the data base, the probability of a release becomes 6.9×10^{-7} per mile per car. Glickman (1988) also shows that the probability of a derailment is a function of track class. Adjusting the overall probability to reflect accidents on a Class 5/6 line (the class of interest) results in a probability of an accident with a release of 2.3×10^{-7} per mile per car.

Saccomanno, et al. (1989) estimates that the probability of a mainline derailment for a high volume rail line is between 1.1×10^{-7} and 9.7×10^{-7} per mile per car. The study also estimates that approximately 3 percent of railcar accidents result in release of material. The study also states that only 40 percent of the railway spills are a result of accidents with the other 60 percent

due to other causes. Applying these factors to the data base results in a probability of accident with release of between 8.3×10^{-9} and 7.3×10^{-8} per mile per car. This is 3 to 28 times lower than the above estimate.

A.D. Little (1983) estimates that the derailment rate is 8.4×10^{-10} per gross ton-miles for Class 5/6 tracks and account for 89 percent of mainline accidents. A. D. Little also estimates that the probability of a release given a derailment is 21 percent. Assuming that an average loaded rail car weighs 80 tons and applying the above statistics results in an overall estimate of a rail accident with a spill of 1.6×10^{-8} per mile per car. This estimate is between the earlier two. Thus, taking extremes into consideration, it is estimated that the probability of a train accident with a spill is between 2.3×10^{-7} and 8.3×10^{-9} per mile per car.

Project Related Accident Probability and Safety Risk

Assuming 30 rail cars per day are transported to the site and a car travels an average of 100 miles, then the annual probability of an accident with a spill would be less than 16 percent [$1-(1-2.3 \times 10^{-7})^{100 \times 30 \times 260}$; once in 6 years] which would be classified as "likely" (see Table F2-2).

The consequences of a materials release would be similar to that of a truck release except it is possible that a larger quantity of residual material could be released from a train. Using the same assumptions as for a truck accident except with a larger release, it was determined that there would be no acute hazard from VOCs in the waste material. Likewise, the exposure level to lead at 20m and 100m were calculated to be 1.4 and 0.26 $\mu g/m^3$ respectively, which are below the established acute limit. No significant impact to the public would result.

It is noted here that the annual probability of an accident with release from the transportation of the waste material by either truck or train after sustained operations have begun would be approximately 23 percent (1 - prob no release from trucks x prob no release from trains = 1-(1 .08) x (1-.16) = 1-.77).

Spill Responsibility

AT&SF railroad would be responsible for responding to an accident and release. The local fire authority also has primary authority for responding to this type of accident. The San Bernardino County Environmental Health Services Department would also respond as appropriate.

Hazardous Material Handling Accident at the HVR Site

As stated previously, the HVR site is located well away from residences or other places of public assembly. The major risk from material handling accidents would be the typical type industrial accidents involving workers which would be localized. A spillage of material during onsite transportation, handling, or storage would be similar in nature to a truck or rail

transportation accident. As shown earlier, these type accidents do not pose an acute hazard to the surrounding area.

Hazard of Site to Recreation Visitors

The proposed project site is presently used to a limited degree by hikers and off-highway vehicles. Precautions have been proposed to prevent or minimize any safety impacts to visitors. The facilities area (the area where the office building, truck and rail scales, truck and rail unloading facilities, truck and rail cleaning facilities, etc. are located) would be fenced to bar public access. The containment areas under operation would also be fenced. Areas of future containment would not be fenced until operations proceed to those areas. There would be 24-hour security at the facility.

With the above measures in effect, it is felt that the project site and its operations would not present a hazard to members of the public and no significant impact would result. The presence of a fire department with trained personnel and a security force would most likely improve response time and services should an accident occur on the project site.

As shown above, the possibility of an accident is classified as likely. However, a release of the hazardous waste material should not result in injury or death to members of the public. Thus, the potential consequence of accidents involving the hazardous waste material is classified as negligible. The only possible public safety impact would be from the increased level of traffic associated with the proposed project. Any increase in traffic increases the potential for accidents (e.g. vehicle/vehicle, vehicle/pedestrian) and injury or death to the public. The increase from the proposed action is not considered to result in significant impacts.

COMPUTER PRINTOUTS

11-30-91
14:55:06

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

Hidden Valley Containment Area - Stability Class A

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/S) = 1.000
SOURCE HEIGHT (M) = .00
LENGTH OF SIDE (M) = 24.00
RECEPTOR HEIGHT (M) = 1.50
IOPT (1=URB,2=RUR) = 2

BUOY. FLUX = .00 M**4/S**3; MOM. FLUX = .00 M**4/S**2.

*** STABILITY CLASS 1 ONLY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
100.	733.6	1	1.0	1.0	320.0	.0	30.9	13.9	NO
610.	14.46	1	1.0	1.0	320.0	.0	138.2	159.4	NO
732.	8.799	1	1.0	1.0	320.0	.0	161.7	234.5	NO
7720.	1.007	1	1.0	1.0	320.0	.0	1237.9	5000.0	NO
11300.	.7281	1	1.0	1.0	320.0	.0	1712.3	5000.0	NO
13200.	.6383	1	1.0	1.0	320.0	.0	1953.2	5000.0	NO
16900.	.5182	1	1.0	1.0	320.0	.0	2405.8	5000.0	NO
27300.	.3470	1	1.0	1.0	320.0	.0	3592.3	5000.0	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	733.6	100.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

11-30-91
15:00:04

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

Hidden Valley Containment Area - Stability Class B

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/S) = 1.000
SOURCE HEIGHT (M) = .00
LENGTH OF SIDE (M) = 24.00
RECEPTOR HEIGHT (M) = 1.50
IOPT (1=URB,2=RUR) = 2

BUOY. FLUX = .00 M**4/S**3; MOM. FLUX = .00 M**4/S**2.

*** STABILITY CLASS 2 ONLY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
100.	1257.	2	1.0	1.0	320.0	.0	23.6	10.6	NO
610.	48.80	2	1.0	1.0	320.0	.0	102.6	63.5	NO
732.	34.13	2	1.0	1.0	320.0	.0	120.1	77.6	NO
7720.	1.326	2	1.0	1.0	320.0	.0	940.3	1029.0	NO
11300.	.9534	2	1.0	1.0	320.0	.0	1307.6	1563.0	NO
13200.	.8339	2	1.0	1.0	320.0	.0	1495.0	1853.5	NO
16900.	.6745	2	1.0	1.0	320.0	.0	1848.4	2430.7	NO
27300.	.4481	2	1.0	1.0	320.0	.0	2782.1	4113.7	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1257.	100.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

11-30-91
15:01:52

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

Hidden Valley Containment Area - Stability Class C

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/S) = 1.000
SOURCE HEIGHT (M) = .00
LENGTH OF SIDE (M) = 24.00
RECEPTOR HEIGHT (M) = 1.50
IOPT (1=URB,2=RUR) = 2

BUOY. FLUX = .00 M**4/S**3; MOM. FLUX = .00 M**4/S**2.

*** STABILITY CLASS 3 ONLY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
100.	2441.	3	1.0	1.0	320.0	.0	17.2	7.4	NO
610.	117.2	3	1.0	1.0	320.0	.0	69.8	38.9	NO
732.	84.83	3	1.0	1.0	320.0	.0	81.6	46.0	NO
7720.	1.907	3	1.0	1.0	320.0	.0	654.4	396.5	NO
11300.	1.359	3	1.0	1.0	320.0	.0	917.2	561.7	NO
13200.	1.185	3	1.0	1.0	320.0	.0	1052.2	647.5	NO
16900.	.9528	3	1.0	1.0	320.0	.0	1308.4	811.7	NO
27300.	.6255	3	1.0	1.0	320.0	.0	1993.3	1258.7	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	2441.	100.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

11-30-91
15:02:18

*** SCREEN-1.1 MODEL RUN ***
*** VERSION DATED 88300 ***

Hidden Valley Containment Area - Stability Class D

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/S) = 1.000
SOURCE HEIGHT (M) = .00
LENGTH OF SIDE (M) = 24.00
RECEPTOR HEIGHT (M) = 1.50
IOPT (1=URB,2=RUR) = 2

BUOY. FLUX = .00 M**4/S**3; MOM. FLUX = .00 M**4/S**2.

*** STABILITY CLASS 4 ONLY ***

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
100.	4970.	4	1.0	1.0	320.0	.0	13.1	4.7	NO
610.	310.2	4	1.0	1.0	320.0	.0	47.6	21.5	NO
732.	230.1	4	1.0	1.0	320.0	.0	55.4	24.9	NO
7720.	6.346	4	1.0	1.0	320.0	.0	434.8	115.3	NO
11300.	3.615	4	1.0	1.0	320.0	.0	609.2	144.5	NO
13200.	2.887	4	1.0	1.0	320.0	.0	698.8	157.8	NO
16900.	2.026	4	1.0	1.0	320.0	.0	868.9	181.5	NO
27300.	1.064	4	1.0	1.0	320.0	.0	1323.8	238.1	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	4970.	100.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

CALIFORNIA AIR RESOURCES BOARD AND DEPARTMENT OF HEALTH SERVICES
HEALTH RISK ASSESSMENT MODEL
NOVEMBER 1990 VERSION

RUN BY: Alex Bealer
COMPANY NAME: Reese-Chambers
PROJECT NAME: HVR
DATE OF RUN: 12-02-1991
POLLUTANT DATA FILE VERSION: 11/09/90

REPORT TYPE: CHRONIC EXPOSURE AND INDIVIDUAL CANCER RISK

****

EMISSION FILE NAME: c:hidval.E

POLLUTANT	EMISSION RATE (G/SEC)
2-NITROPROPANE	1.2D-06
BENZENE	1.7D-05
CADMIUM	2.3D-08
CARBON TETRACHLORIDE	8.9D-06
CHLOROBENZENE	2.0D-06
CHROMIUM 6+	8.4D-08
COPPER	6.4D-08
CRESOLS (O-,M-,P-)	4.7D-08
IRON	6.1D-06
LEAD	1.3D-07
MERCURY	5.1D-10
METHANOL	2.2D-05
METHYLENE CHLORIDE	2.4D-04
NICKEL	4.6D-08
NITROBENZENE	9.6D-08
P-DICHLOROBENZENE	2.3D-07
PERCHLOROETHYLENE	3.1D-06
TCDD EQUIVALENT	2.6D-12
TOLUENE	1.5D-05
TRICHLOROETHYLENE	1.3D-05
XYLENE	5.2D-06

****

DISPERSION FACTOR CHI OVER Q USED: 497

****

ROUTE FILE NAME: c:hidval.I

1. DEPOSITION VELOCITY IS - .02
2. MOTHER'S MILK INCLUDED - YES
3. THE FRACTION OF HOMEGROWN PRODUCE IS - .1

GENERAL ANIMAL EXPOSURE FACTORS

4. FRACTION OF ANIMAL'S DIET FROM GRAZING IS - 0
5. FRACTION OF ANIMAL'S DIET FROM IMPACTED FEED IS - 0
6. FRACTION OF ANIMAL'S WATER IMPACT BY DEPOSITION IS - 0

ANIMAL X/Q AND WATER FACTORS

7. X/Q SURFACE AREA VOLUME VOLUME CHANGES RUNOFF CONTRIBUTION

0	0	0	0	0

8. FRACTION OF MEAT IN DIET PRODUCED AT HOME IS - 0
9. THE FOLLOWING FRACTIONS OF EACH TYPE ARE PRODUCED

BEEF	PORK	LAMB	CHICKEN
0	0	0	0

10. FRACTION OF EGGS PRODUCED ON SITE IS - 0

DAIRY PRODUCTS

11. FRACTION OF MILK PRODUCED ON SITE IS - 0
12. GOAT MILK FRACTION IS - 0

DRINKING WATER WILL BE EVALUATED USING THE FOLLOWING FACTORS

13. FRACTION OF IMPACTED DRINKING WATER - 0

14. X/Q SURFACE AREA VOLUME VOLUME CHANGES RUNOFF CONTRIBUTION

0	0	0	0	0

FISH WILL BE EVALUATED WITH THE FOLLOWING FACTORS

15. FISH FROM IMPACTED WATER - 0

16. X/Q SURFACE AREA VOLUME VOLUME CHANGES RUNOFF CONTRIBUTION

0	0	0	0	0

17. RUNOFF WILL BE EVALUATED USING THE FOLLOWING FACTORS

FACILITY HOURS OF OPERATIONS - 0
ANNUAL RAINFALL - 0
WATERSHED AREA IMPACTED - 0
WATERSHED RUNOFF COEFFICIENT - 0
WASH COEFFICIENT - 0

****

RESULTS

****

CHRONIC EXPOSURE BY POLLUTANT AND ROUTE

POLLUTANT	INHALATION (UG/M3)	INGESTION (MG/KG-DAY)
2-NITROPROPANE	6.2E-04	0.0E+00
BENZENE	8.6E-03	0.0E+00
CADMIUM	1.1E-05	8.3E-08
CARBON TETRACHLORIDE	4.4E-03	0.0E+00
CHLOROBENZENE	9.8E-04	0.0E+00
CHROMIUM 6+	4.2E-05	0.0E+00
COPPER	3.2E-05	1.3E-07
CRESOLS (O-,M-,P-)	2.3E-05	0.0E+00
IRON	3.0E-03	1.3E-05
LEAD	6.3E-05	2.8E-07

MERCURY	2.5E-07	2.3E-09
METHANOL	1.1E-02	0.0E+00
METHYLENE CHLORIDE	1.2E-01	0.0E+00
NICKEL	2.3E-05	1.5E-07
NITROBENZENE	4.8E-05	0.0E+00
P-DICHLOROBENZENE	1.2E-04	0.0E+00
PERCHLOROETHYLENE	1.6E-03	0.0E+00
TCDD EQUIVALENT	1.3E-09	3.1E-12
TOLUENE	7.5E-03	0.0E+00
TRICHLOROETHYLENE	6.3E-03	0.0E+00
XYLENE	2.6E-03	0.0E+00

****

INDIVIDUAL CANCER RISK BY POLLUTANT AND ROUTE

POLLUTANT	AIR	SOIL	SKIN	GARDEN	MMILK	OTHER
BENZENE	2.9D-07	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
CADMIUM	3.0D-08	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
CARBON TETR	1.2D-07	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
CHROMIUM 6+	3.7D-06	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
METHYLENE C	7.4D-08	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
NICKEL	3.4D-09	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
P-DICHLOROB	8.0D-10	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
PERCHLOROET	5.7D-10	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
TCDD EQUIVA	3.0D-08	7.4D-08	5.3D-08	3.0D-08	1.0D-07	0.0D+00
TRICHLOROET	7.9D-09	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
Route Total	4.2E-06	7.4E-08	5.3E-08	3.0E-08	1.0E-07	0.0E+00

Total Risk 4.5E-06

****

FOR CALIFORNIA AIR TOXICS HOT SPOTS ACT PURPOSES ONLY
ADDITIONAL SCREENING RISK BY POLLUTANT AND ROUTE

POLLUTANT	AIR	SOIL	SKIN	GARDEN	MMILK	OTHER
2-NITROPROP	1.0D-05	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
LEAD	3.2D-10	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
MERCURY	1.3D-12	0.0D+00	0.0D+00	0.0D+00	0.0D+00	0.0D+00
Route Total	1.0E-05	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00

Screening Total 1.0E-05

****

END OF REPORT

****

APPENDIX G

NOISE DATA

APPENDIX G - NOISE DATA

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EXISTING CONDITIONS

Calveno emissions

Lane #/Road segment	I-40 EAST OF BARSTOW - A.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	403	129	326
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.0	13.0	17.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.9	67.5	75.3
Leq(Σ h)(dBA) Tot. this run	76		
Leq(Σ Lanes/element)	76		
Leq(Σ elements)	76		

Calveno emissions

Lane #/Road segment	I-40 EAST OF BARSTOW - OFF HOURS		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	163
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.3
Leq(Σ h)(dBA) Tot. this run	73		
Leq(Σ Lanes/element)	73		
Leq(Σ elements)	73		

Calveno emissions

Lane #/Road segment	I-40 EAST OF BARSTOW - P.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	322	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.0	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	64.9	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 EAST OF BARSTOW - NIGHT		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	92	30	75
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	11.5	6.7	10.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	59.5	61.2	68.9
Leq(Σ h)(dBA) Tot. this run	70		
Leq(Σ Lanes/element)	70		
Leq(Σ elements)	70		

Calveno emissions

Lane #/Road segment	I-15 VICT TO BARSTOW - A.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	1678	234	419
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	24.2	15.6	18.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Ve /pe	72.1	70.1	76.4
Leq(Σ h)(dBA) Tot. this run	78		
Leq(Σ Lanes/element)	78		
Leq(Σ elements)	78		

Calveno emissions

Lane #/Road segment	I-15 VICT TO BARSTOW - OFF HOURS		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	839	117	210
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	21.1	12.6	15.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	69.1	67.1	73.4
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-15 VICT TO BARSTOW - P.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	1342	187	335
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	23.2	14.6	17.2
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	71.1	69.2	75.4
Leq(Σ h)(dBA) Tot. this run	77		
Leq(Σ Lanes/element)	77		
Leq(Σ elements)	77		

Calveno emissions

Lane #/Road segment	I-15 VICT TO BARSTOW - NIGHT		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	384	53	96
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle. (Left)	-90.0	-90.0	-90.0
Roadway Angle. (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.8	9.2	11.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj. dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.7	63.7	70
Leq(Σ h)(dBA) Tot. this run	72		
Leq(Σ Lanes/element)	72		
Leq(Σ elements)	72		

Calveno emissions

Lane #/Road segment	I-15 395 TO VICT - A.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	4335	445	778
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	28.3	18.4	20.8
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	76.2	72.9	79
Leq(Σ h)(dBA) Tot. this run	82		
Leq(Σ Lanes/element)	82		
Leq(Σ elements)	82		

Calveno emissions

Lane #/Road segment	I-15 395 TO VICT - OFF HOURS		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	2168	222	389
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	25.3	15.4	17.8
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	73.2	69.9	76
Leq(Σ h)(dBA) Tot. this run	78		
Leq(Σ Lanes/element)	78		
Leq(Σ elements)	78		

Calveno emissions

Lane #/Road segment	I-15 395 TO VICT - P.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	3468	356	622
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	27.3	17.4	19.8
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	75.2	72	78.1
Leq(Σ h)(dBA) Tot. this run	81		
Leq(Σ Lanes/element)	81		
Leq(Σ elements)	81		

Calveno emissions

Lane #/Road segment	I-15 395 TO VICT - NIGHT		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	995	102	179
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	21.9	12.0	14.4
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	69.8	66.5	72.7
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-15 S.B. TO 395 - A.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	5165	392	981
Speed (MPH)	50	50	50
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	71.1	78.8	83.0
Traffic flow adj. (dBA)	29.8	18.6	22.6
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	74.7	71.1	79.3
Leq(Σ h)(dBA) Tot. this run	81		
Leq(Σ Lanes/element)	81		
Leq(Σ elements)	81		

Calveno emissions

Lane #/Road segment	I-15 S.B. TO 395 - OFF HOURS		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	2583	196	490
Speed (MPH)	50	50	50
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle. (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	71.1	78.8	83.0
Traffic flow adj. (dBA)	26.8	15.6	19.6
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding - Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	71.7	68.1	76.3
Leq(Σ h)(dBA) Tot. this run	78		
Leq(Σ Lanes/element)	78		
Leq(Σ elements)	78		

Calveno emissions

Lane #/Road segment	I-15 S.B. TO 395 - P.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	4132	314	785
Speed (MPH)	50	50	50
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	71.1	78.8	83.0
Traffic flow adj. (dBA)	28.9	17.7	21.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	73.7	70.2	78.4
Leq(Σ h)(dBA) Tot. this run	80		
Leq(Σ Lanes/element)	80		
Leq(Σ elements)	80		

Calveno emissions

Lane #/Road segment	I-15 S.B. TO 395 - NIGHT		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	1185	90	225
Speed (MPH)	50	50	50
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	71.1	78.8	83.0
Traffic flow adj. (dBA)	23.4	12.2	16.2
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding - Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	68.3	64.7	72.9
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	SR-58 WEST OF BARSTOW - A.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	454	41	183
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.5	8.0	14.5
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	66.4	62.6	72.8
Leq(Σ h)(dBA) Tot. this run	74		
Leq(Σ Lanes/element)	74		
Leq(Σ elements)	74		

Calveno emissions

Lane #/Road segment	SR-58 WEST OF BARSTOW - OFF HOURS		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	227	20	92
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.5	4.9	11.5
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	63.4	59.4	69.8
Leq(Σ h)(dBA) Tot. this run	71		
Leq(Σ Lanes/element)	71		
Leq(Σ elements)	71		

Calveno emissions

Lane #/Road segment	SR-58 WEST OF BARSTOW - P.M. RUSH		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	363	33	146
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.5	7.1	13.6
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding - Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.4	61.6	71.8
Leq(Σ h)(dBA) Tot. this run	73		
Leq(Σ Lanes/element)	73		
Leq(Σ elements)	73		

Calveno emissions

Lane #/Road segment	SR-58 WEST OF BARSTOW - NIGHT		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	105	9	42
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle. (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	12.1	1.5	8.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(n)(dBA)/Veh type	60	5c	5c.4
Leq(Σ n)(dBA) Tot. this run	6E		
Leq(Σ Lanes/element)	6E		
Leq(Σ elements)	6E		

Methodology for calculating Ldn for railroad noise as presented in "The Noise Guidebook", U.S. Department of Housing and Urban Development

Assumptions:

Speed = 60 mph
of engines/train = 4
of railcars/train = 75
of operations/day = 50
% of nighttime operations = 15%
The site is not near a grade crossing and requires no whistles

For engine noise the effective number of operations is calculated as:

2 (# of engines adjustment) X 0.5 (speed adjustment) X 1 (day/night adjustment) X 50 (# of operations) = 50

This value (50) is entered into the Workchart 3 for 100 and 500 feet and Ldn's of 71 and 61, respectively are ascertained.

For railcar noise the effective number of operations is calculated as:

1.5 (# of cars adjustment) X 4.0 (speed adjustment) X 1 (day/night adjustment) X 4 (bolted rails adjustment) X 50 (# of operations/day) = 1,200

This value (1,200) is entered into the Workchart 4 for 100 and 500 feet and Ldn's of 73 and 63, respectively are ascertained.

The noise from the engine operations and railcars are then combined logrithmically as follows:

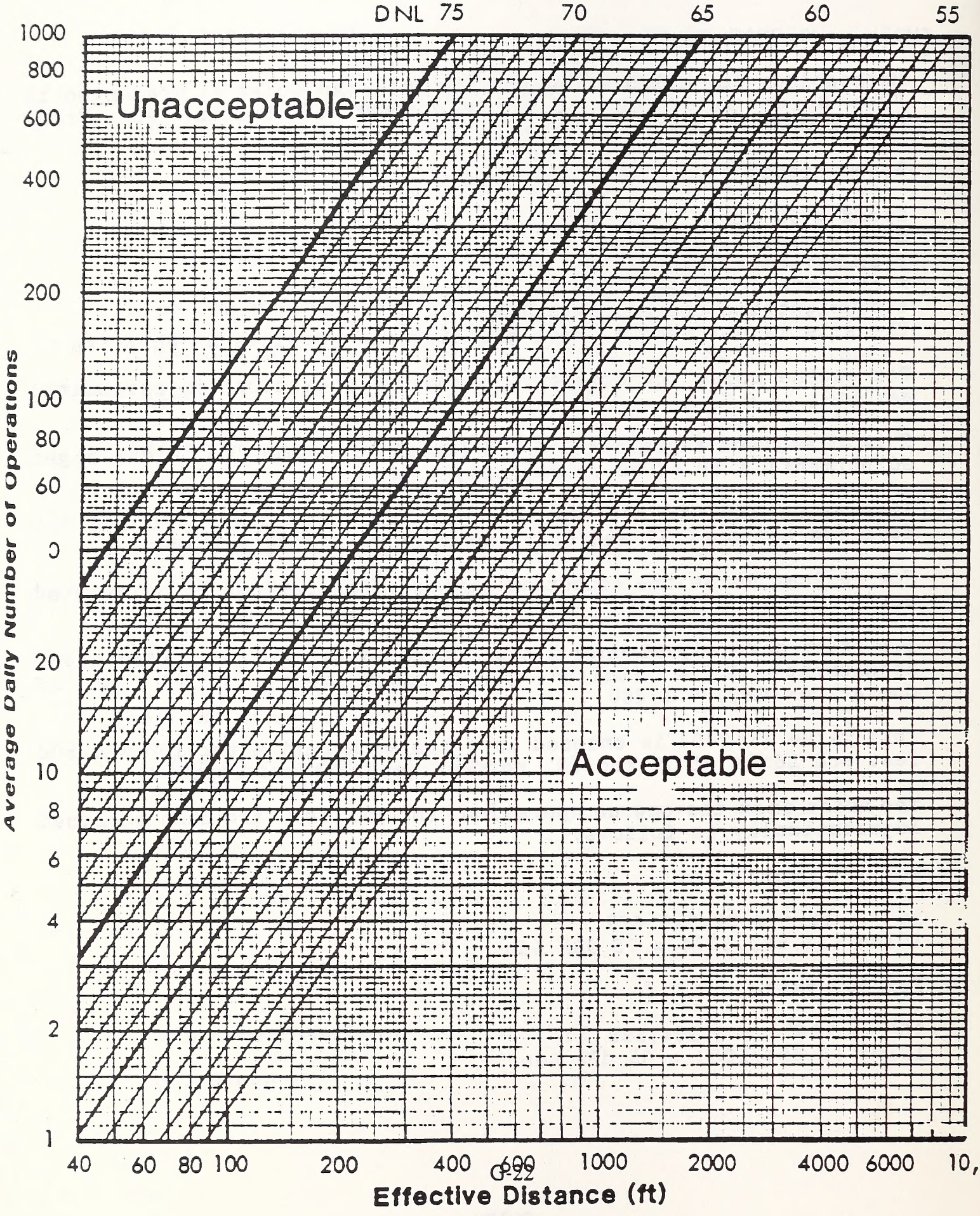
For 100 feet:

$10^{7.1} + 10^{7.3} = 32,541,877$
10log (32,541,877) = 75 dBA Ldn

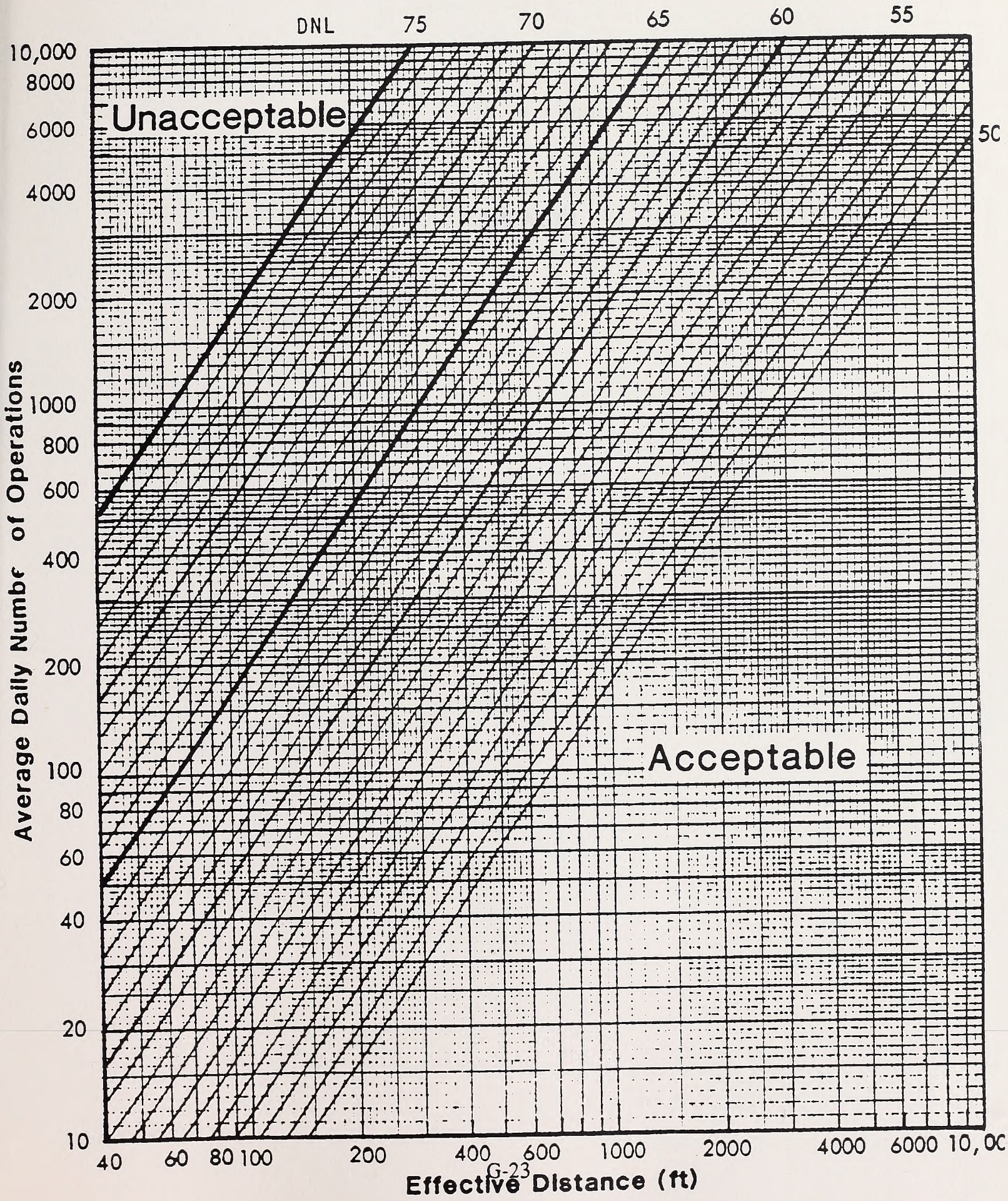
For 500 feet:

$10^{6.1} + 106^{6.3} = 3,254,188$
10log (3,254,188) = 65 dBA Ldn

Workchart 3
Railroads - Diesel Locomotives



Workchart 4
Railroads - Cars and Rapid Transit



IMPACTS

Calveno emissions

Lane #/Road segment	I-40 - INIT CONS 6-7AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	443	129	343
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.4	13.0	17.3
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	66.3	67.5	75.5
Leq(Σ h)(dBA) Tot. this run	77		
Leq(Σ Lanes/element)	77		
Leq(Σ elements)	77		

Calveno emissions

Lane #/Road segment	I-40 INIT CONS 7-9AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	403	129	341
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.0	13.0	17.2
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.9	67.5	75.5
Leq(Σ h)(dBA) Tot. this run	77		
Leq(Σ Lanes/element)	77		
Leq(Σ elements)	77		

Calveno emissions

Lane #/Road segment	I-40 INIT CONS 9AM-4PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	178
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.4
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.6
Leq(Σ h)(dBA) Tot. this run	74		
Leq(Σ Lanes/element)	74		
Leq(Σ elements)	74		

Calveno emissions

Lane #/Road segment	I-40 INIT CONS 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	342	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.3	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.2	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 INIT CONS 5-7PM		
Venicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	322	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.0	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	64.9	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 INIT CONS 7-10PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	163
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.3
Leq(Σ h)(dBA) Tot. this run	73		
Leq(Σ Lanes/element)	73		
Leq(Σ elements)	73		

Calveno emissions

L· ₹ #/Road segment	I-40 INIT CONS 10PM-6AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	92	30	75
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	11.5	6.7	10.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	59.5	61.2	68.9
Le¬(Σ h)(dBA) Tot. this run	70		
Leq(Σ Lanes/element)	70		
Leq(Σ elements)	70		

Calveno emissions

Lane #/Road segment	CORRIDOR - INIT OPER 6-7AM 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	47	0	0
Speed (MPH)	55	55	34.16149
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	72.8	0.0	0.0
Traffic flow adj. (dBA)	9.0	0.0	0.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	55.5	0	0
Leq(Σ h)(dBA) Tot. this run	55		
Leq(Σ Lanes/element)	55		
Leq(Σ elements)	55		

Calveno emissions

Lane #/Road segment	CORRIDOR - INIT OPER 7AM-4PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	0	0	10
Speed (MPH)	55	55	55
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	0.0	0.0	83.8
Traffic flow adj. (dBA)	0.0	0.0	2.3
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	0	0	59.8
Leq(Σ h)(dBA) Tot. this run	60		
Leq(Σ Lanes/element)	60		
Leq(Σ elements)	60		

Calveno emissions

Lane #/Road segment	I-40 - INIT OPER 6-7AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	450	129	326
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.4	13.0	17.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	66.4	67.5	75.3
Leq(Σ h)(dBA) Tot. this run	76		
Leq(Σ Lanes/element)	76		
Leq(Σ elements)	76		

Calveno emissions

I e #/Road segment	I-40 - INIT OPER 7-9AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	403	129	336
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.0	13.0	17.2
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.9	67.5	75.4
Leq(Σ h)(dBA) Tot. this run	76		
Leq(Σ Lanes/element)	76		
Leq(Σ elements)	76		

Calveno emissions

I e #/Road segment	I-40 - INIT OPER 9AM-4PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	173
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.3
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.5
Leq(Σ h)(dBA) Tot. this run	74		
Leq(Σ Lanes/element)	74		
Leq(Σ elements)	74		

Calveno emissions

Lane #/Road segment	I-40 - INIT OPER 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	369	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.6	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.5	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 - INIT OPER 5-7PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	322	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.0	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	64.9	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 - INIT OPER 7-10PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	163
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.3
Leq(Σ h)(dBA) Tot. this run	73		
Leq(Σ Lanes/element)	73		
Leq(Σ elements)	73		

Calveno emissions

Lane #/Road segment	I-40 - INIT OPER 10PM-6AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	92	30	75
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	11.5	6.7	10.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	59.5	61.2	68.9
Leq(Σ h)(dBA) Tot. this run	70		
Leq(Σ Lanes/element)	70		
Leq(Σ elements)	70		

Calveno emissions

Lane #/Road segment	CORRIDOR - SUB CONS 6-7AM 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	97	0	0
Speed (MPH)	55	55	34.16149
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	72.8	0.0	0.0
Traffic flow adj. (dBA)	12.2	0.0	0.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	58.6	0	0
Leq(Σ h)(dBA) Tot. this run	59		
Leq(Σ Lanes/element)	59		
Leq(Σ elements)	59		

Calveno emissions

Lane #/Road segment	CORRIDOR - SUB CONS 7AM-4PM		
Venicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	0	0	13
Speed (MPH)	55	55	55
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	0.0	0.0	83.8
Traffic flow adj. (dBA)	0.0	0.0	3.4
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	0	0	60.9
Leq(Σ h)(dBA) Tot. this run	61		
Leq(Σ Lanes/element)	61		
Leq(Σ elements)	61		

Calveno emissions

Lane #/Road segment	I-40 - SUB CONS 6-7AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	500	129	326
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.9	13.0	17.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	66.8	67.5	75.3
Leq(Σ h)(dBA) Tot. this run	76		
Leq(Σ Lanes/element)	76		
Leq(Σ elements)	76		

Calveno emissions

Lane #/Road segment	I-40 - SUB CONS 7-9AM		
Venicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	403	129	339
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.0	13.0	17.2
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.9	67.5	75.4
Leq(Σ h)(dBA) Tot. this run	76		
Leq(Σ Lanes/element)	76		
Leq(Σ elements)	76		

Calveno emissions

Lane #/Road segment	I-40 - SUB CONS 9AM-4PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	176
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.4
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.6
Leq(Σ h)(dBA) Tot. this run	74		
Leq(Σ Lanes/element)	74		
Leq(Σ elements)	74		

Calveno emissions

L- `e #/Road segment	I-40 - SUB CONS 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	419	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.1	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	66.1	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Line #/Road segment	I-40 - SUB CONS 5-7PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	322	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.0	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	64.9	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 - SUB CONS 7-10PM		
Venicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	163
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.3
Leq(Σ h)(dBA) Tot. this run	73		
Leq(Σ Lanes/element)	73		
Leq(Σ elements)	73		

Calveno emissions

Lane #/Road segment	I-40 - SUB CONS 10PM-6AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	92	30	75
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	11.5	6.7	10.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	59.5	61.2	68.9
Leq(Σ h)(dBA) Tot. this run	70		
Leq(Σ Lanes/element)	70		
Leq(Σ elements)	70		

Calveno emissions

Lane #/Road segment	CORRIDOR - TRUCKS ONLY 6-7AM 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	56	0	0
Speed (MPH)	55	55	34.16149
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	72.8	0.0	0.0
Traffic flow adj. (dBA)	9.8	0.0	0.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	56.2	0	0
Leq(Σ h)(dBA) Tot. this run	56		
Leq(Σ Lanes/element)	56		
Leq(Σ elements)	56		

Calveno emissions

L e #/Road segment	CORRIDOR - TRUCKS ONLY 7AM-4PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	0	0	20
Speed (MPH)	55	55	55
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	0.0	0.0	83.8
Traffic flow adj. (dBA)	0.0	0.0	5.3
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	0	0	62.8
Leq(Σ h)(dBA) Tot. this run	63		
Leq(Σ Lanes/element)	63		
Leq(Σ elements)	63		

Calveno emissions

Lane #/Road segment	I-40 - TRUCKS ONLY 6-7AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	459	129	326
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.5	13.0	17.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	66.5	67.5	75.3
Leq(Σ h)(dBA) Tot. this run	76		
Leq(Σ Lanes/element)	76		
Leq(Σ elements)	76		

Calveno emissions

Line #/Road segment	I-40 - TRUCKS ONLY 7-9AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	403	129	346
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	18.0	13.0	17.3
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.9	67.5	75.5
Leq(Σ h)(dBA) Tot. this run	77		
Leq(Σ Lanes/element)	77		
Leq(Σ elements)	77		

Calveno emissions

Lane #/Road segment	I-40 - TRUCKS ONLY 9AM-4PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	183
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.5
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.8
Leq(Σ h)(dBA) Tot. this run	74		
Leq(Σ Lanes/element)	74		
Leq(Σ elements)	74		

Calveno emissions

Lane #/Road segment	I-40 - TRUCKS ONLY 4-5PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	378	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.7	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	65.6	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

Lane #/Road segment	I-40 - TRUCKS ONLY 5-7PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	322	103	261
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	17.0	12.0	16.1
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	64.9	66.6	74.3
Leq(Σ h)(dBA) Tot. this run	75		
Leq(Σ Lanes/element)	75		
Leq(Σ elements)	75		

Calveno emissions

I e #/Road segment	I-40 - TRUCKS ONLY 7-10PM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	202	64	163
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	15.0	10.0	14.0
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	62.9	64.5	72.3
Leq(Σ h)(dBA) Tot. this run	73		
Leq(Σ Lanes/element)	73		
Leq(Σ elements)	73		

Calveno emissions

Lane #/Road segment	I-40 - TRUCKS ONLY 10PM-6AM		
Vehicle Class	Auto	Med Truck	Hvy Truck
Volume(VPH)	92	30	75
Speed (MPH)	60	60	60
Dist. to ctr. of near lane	50	50	50
Site/Barrier Type	Soft	Soft	Soft
Roadway Angle, (Left)	-90.0	-90.0	-90.0
Roadway Angle, (Right)	+90.0	+90.0	+90.0
Ref. energy emiss. level (dBA)	74.2	80.8	84.5
Traffic flow adj. (dBA)	11.5	6.7	10.7
Distance adj. (dBA)	-0.1	-0.1	-0.1
Ground effect adj. (dBA)	-1.2	-1.2	-1.2
Barrier fresnel #	0	0	0
Barrier attenuation (dBA)	0	0	0
Shielding + Grade Adj.(dBA)	0	0	0
Leq(h)(dBA)/Veh type	59.5	61.2	68.9
Leq(Σ h)(dBA) Tot. this run	70		
Leq(Σ Lanes/element)	70		
Leq(Σ elements)	70		

APPENDIX H

CULTURAL RESORUCES BACKGROUND INFORMATION

APPENDIX H - CULTURAL RESOURCES BACKGROUND INFORMATION

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APPENDIX H

ARCHAEOLOGICAL BACKGROUND

Prehistoric periods in the region are based on lithic typology. The various periods are presented below along with a brief statement as to the extent of known or potential site information. These primary recognized prehistorical periods in the region are:

- Paleo-Indian (to 10,000 B.P.)
- Lake Mojave (10,000 to 6,000 B.P.)
- Pinto (6,000 to 4,000 B.P.)
- Gypsum (4,000 to 1,500 B.P.)
- Rose Spring (1,500 to 800 B.P.)
- Late Prehistoric (800 B.P. to Historic Contact)

Paleo-Indian (to 10,000 B.P.)

The Paleo-Indian period (terminal Pleistocene) includes material belonging to the Pre-projectile Point and Fluted Point traditions. Though the earliest agreed upon archaeological culture in the New World is of the fluted projectile-point type, several claims for earlier, pre-projectile point sites have been claimed for the Mojave Desert. Two of these are in the vicinity of the Cady Mountains.

Lake Mojave (10,000 to 6,000 B.P.)

The Lake Mojave Period is associated with the early Holocene occupation of lakeside environments. The hallmark of the period is the presence of Lake Mojave or Silver Lake projectile points found in association with old lakeshores. Hunting and utilization of lacustrine resources presumably formed the subsistence base.

While no Lake Mojave Period sites are known in the immediate vicinity of Hidden Valley, a number of Lake Mojave Period sites are known from the shore of Pleistocene Lake Mojave, located just to the northeast of Hidden Valley. Other sites possibly dating to this time are also in the vicinity.

Pinto (6,00 to 4,000 B.P.)

The definition of Pinto-type points is still not agreed upon, therefore using these points as temporal markers is somewhat problematical.

The Pinto Period appears to be a broadly generalized cultural pattern developed in response to the desiccation of the Pleistocene lakes and climatic movement toward a more xeric environment. It is possible that Pinto developed directly from Lake Mojave at the end of the Pleistocene and ushered in the Archaic in the Mojave Desert.

No Pinto materials are known from the immediate vicinity of the project area. A Pinto site has been reported at Black Butte, near Newberry Springs and several are known to the north, in Fort Irwin.

Gypsum (4,000 to 1,500 B.P.)

The Gypsum Period is marked by the presence of Elko series projectile points, although Humboldt Concave Base points also occur. Very little is known regarding the subsistence base or social organization of Gypsum populations as few sites dating to that period have been excavated.

Archaeological remains dating from the Gypsum Period are relatively uncommon in the central Mojave Desert. It is not clear if sites from this period are rare or underrepresented in the known archaeological record. Locating and examining such sites is an important research goal. Some Gypsum Period material is known from Newberry Cave, southwest of Hidden Valley.

Rose Spring (1,500 to 800 B.P.)

This Period is also know as the Saratoga Springs Period. Rose Spring is used herein due to the diagnostic projectile point series, originally identified at the Rose Spring site in 1963.

Late Prehistoric (800 B.P. to Historic Contact)

The Late Prehistoric Period is characterized by Desert Side-notched and Cottonwood projectile points. The period presumably reflects the late prehistory of the ethnographic groups inhabiting the region, although this assumption may not always have merit. Southwestern Pueblo groups were likely present in the central Mojave during this time, but their influence is unknown. Puebloan materials are known from the Cronese Lakes, the Mojave Sink and Afton Canyon.

An important research question for the region is understanding who the ethnographic Chemehuevi replaced in the eastern Mojave and how it was accomplished.

A number of sites from this time have been excavated but few of those data have been published. Probably the most important is the Afton Canyon site, located on the Mojave River just to the north of Hidden Valley. That site reflects the use of local lithic materials, obtained in quarries located nearby to the south (and just to the north of Hidden Valley). Remains at the site suggest that bighorn sheep were procured, but that they were not butchered on-site. It is

probable that sheep hunting and processing sites related to the Afton Canyon site would be present in the Cady Mountains.

ETHNOGRAPHIC BACKGROUND

During the ethnographic period, the central portion of the Mojave River, likely including Hidden Valley, apparently was claimed by the Vanyume (Beneme). However the Kawaiisu appear to have traveled into the central Mojave Desert on occasion and may have utilized the valley as well. It is also possible that the Cemehuevi occupied a part of the region, but likely late in time.

Vanyume

Little is known about the Vanyume, a division of the Serrano living in the Mojave Desert. The area of Afton Canyon and Hidden Valley seems to have been Vanyume territory, although the Chemehuevi may also have had claims for the area. The Vanyume were sometimes friendly with the Mohave and Chemhuevi but were hostile to the Serrano of the San Bernardino Mountains.

The Vanyume were hunters and gatherers. Subsistence data for the group is generalized from that of the Serrano as a whole. It has been reported that the Vanyume had blankets of rabbit and otter fur, snares of hemp, shell beads and millingstones.

Chemehuevi

The Chemeheuvi are a band of Southern Paiute that entered the eastern Mojave Desert from the north in fairly recent times, possibly in the 17th century based on archaeological data. They are closely related to the Southern Paiute in the Death Valley and southern Nevada regions.

At the time of ethnographic contact, the Chemeheuvi claimed a large portion of the eastern and central Mojave Desert, perhaps as far west as Afton Canyon.

The Chemehuevi seem to have moved east to the Colorado River from the desert and the River Mohave were still fighting the Chemehuevi at contact. The Chemehuevi apparently also received some aid from other Southern Paiute to the north. In the meantime the Chemehuevi had succeeded in moving even further south. Chemehuevi territory also extended on the eastern bank of the Colorado River.

The Chemehuevi were organized into three groups geographically and two primary social divisions. Matrilocality ordinarily was practiced and resulted in the formation of small bands. Political organization was based on the band.

Hunting, of both large and small game, and gathering was the subsistence mode of the Chemeheuvi. Incipient farming was also practiced. Several different types of living and ceremonial structures are known and basketry making was well developed.

Other Groups

The central Mojave Desert was undoubtedly utilized by a variety of ethnographic groups, including the Chumash, Mohave and Kitanemuk. The Kawaiisu are reported to have at least visited the Afton Canyon area, just to the north of Hidden Valley, and it is possible that they visited the Hidden Valley area as well. Unfortunately, central Mojave Desert groups are mentioned infrequently in the ethnographic literature.

APPENDIX I

FINAL SITE ANALYSIS REPORT SUMMARY

APPENDIX I1

ALTERNATIVES SITES

APPENDIX I - ALTERNATIVES SITES

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APPENDIX I1 - ALTERNATIVES SITES

This section provides an analysis of potential alternative sites within the Southwestern United States. This analysis includes the results of a siting analysis prepared by the applicant as well as an analysis of other factors and concerns by Chambers Group. For those wishing more extensive analysis of individual sites contained under the screening analysis, the reader is referred to the siting analysis report contained under separate cover (Science Applications International Corporation, 1991).

I1.1 OUT OF STATE LOCATIONS

Currently, considerable wastes are transported out of southern California to remote locations throughout the western United States. This is due to both to the less restrictive permitting requirements of some states as well as the existence of some facilities better equipped to handle some types of wastes.

The Southern California Waste Management Authority, the San Bernardino County Hazardous Waste Management Plan (HWMP) as well as those plans of adjoining counties call for both waste treatment and minimization as well as establishing facilities within the State of California for hazardous waste residual repositories of those materials that cannot be further treated at the current stage of technology.

The siting of a new facility or continued use of an existing facility out of state was not considered feasible for the following reasons:

- This policy is not consistent with the State, San Bernardino County, or surrounding counties' hazardous waste management planning goals.
- The increased distance required for transportation increases the potential for transportation based accidents.
- There would also be potential impacts to the environment in other locations including out-of-state locations.

I1.2 NORTHERN CALIFORNIA LOCATIONS

Consideration was given to the possibility of locating a hazardous waste residuals repository within Northern California to serve the needs of Southern California. This was not considered feasible and eliminated from further analysis for the following reasons:

- This alternative would not be consistent with the County's Hazardous Waste Management Plan.

- Travel distance would be excessive and statistically increase the potential for accidents as well as costs.

- Most of this area is subject to high rainfall levels and low evaporation rates making the area undesirable for the screening factors outlined in Section I.4.3 below.

I1.3 SITE SCREENING PROCESS FOR SOUTHERN CALIFORNIA

Once the out of State and Northern California regions were eliminated, an analysis of potential sites within the Southern California area was conducted. The site screening process involved several steps which focused the study area to regions within Southern California and then further focused the analysis to specific sites within the region. The factors used for various levels of analysis are described below.

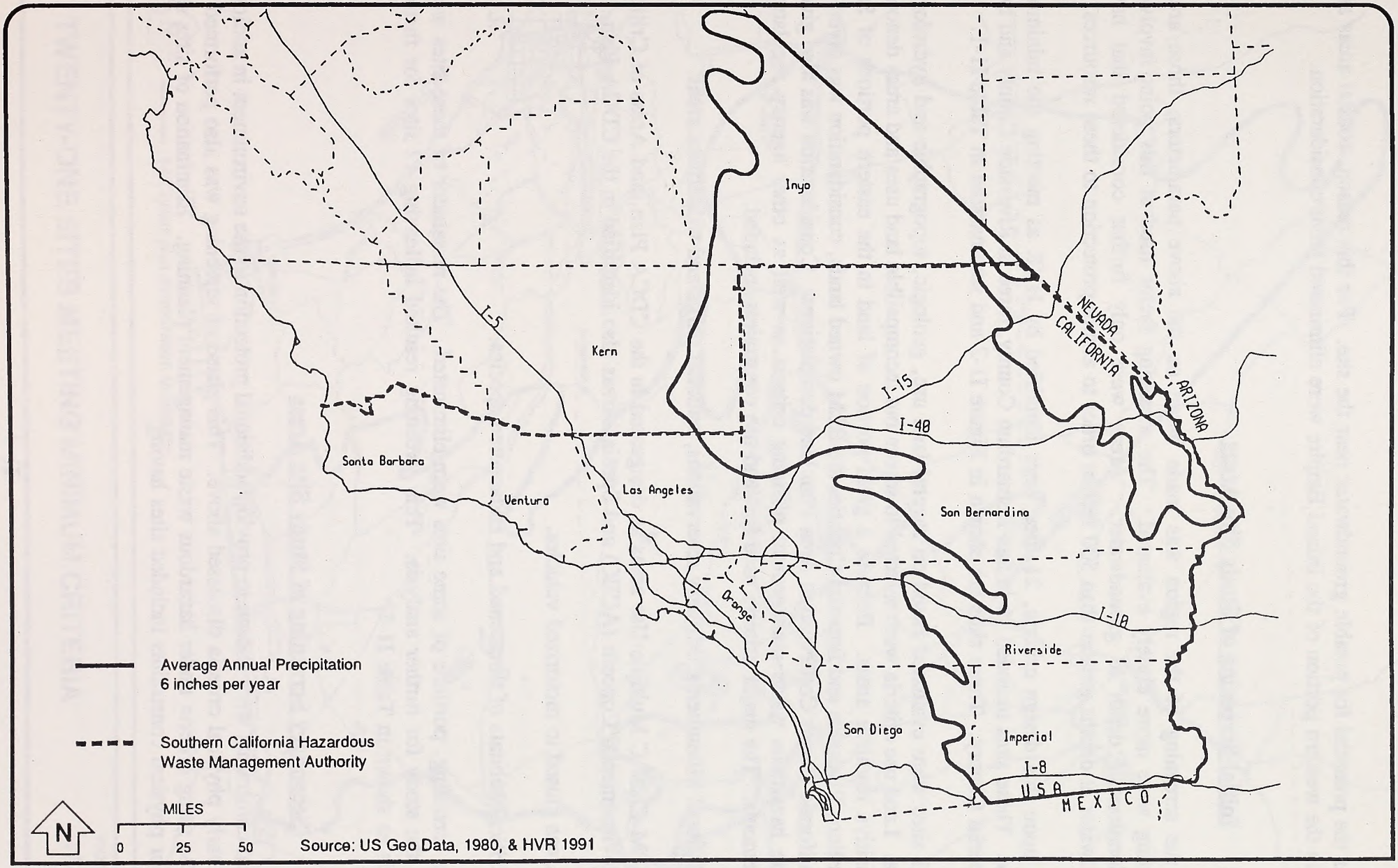
I1.3.1 Regional Screening

The initial screening process identified the primary criteria critical to the siting of a hazardous waste residuals repository. These criteria derive from the goal of siting such a facility in a manner that would result in the minimum of risk to public health and the environment and a facility that would be compatible with other land uses. This initial screening was applied to the Southern California region to narrow the potential locations for the siting of the facility.

The primary screening mechanism was the identification of areas with low rainfall and high evaporation rates. These areas were considered the most appropriate areas since the combination of low rainfall and high evaporation would minimize the potential for saturation of the material and the subsequent migration of the material into the soil and potentially the groundwater. For the purposes of the analysis, the applicant selected the criteria of less than 6 inches of rain per year and 140 inches per year of pan evaporation. This would preclude groundwater recharge of candidate site areas on all but the wettest years. During this initial screening areas of both surface and groundwaters were eliminated as were slopes in excess of 20 percent.

Based on the average annual precipitation criteria alone, the eastern portions of San Bernardino, Riverside and Imperial Counties were retained in the study area as shown in Figure I1-1. Computer mapping was applied to the other criteria to eliminate those areas from further analysis. The complete set of computerized maps are contained within the Science Applications International Corporation report.

Coastal areas, although closer to most generators of hazardous materials, were not considered viable areas due primarily to the exceedance of rainfall and evaporation parameters. Additionally, it would be difficult to find suitable sites due to the higher population densities as



SOUTHERN CALIFORNIA REGION SITE STUDY AREA

FIGURE
I1-1

well as the potential for potable groundwater near the site. For this reason, coastal areas and areas in the western portion of the Inland Empire were eliminated from consideration.

I1.3.2 Initial Screening of Study Site Areas

Once the screening of the region was made based on the above parameters, those areas remaining were more closely evaluated. The screening factor used at this point involved consideration of depth to groundwater. Areas were only further considered that have groundwater at depths greater than 500 feet in order to assure protection to these resources.

Based upon this design criteria, 21 sites were identified by HVR as meeting the minimum criteria. These sites included 16 in San Bernardino County, three in Riverside County and two in Imperial County. These sites are shown in Figure I1-2 and summarized in Table I1-1.

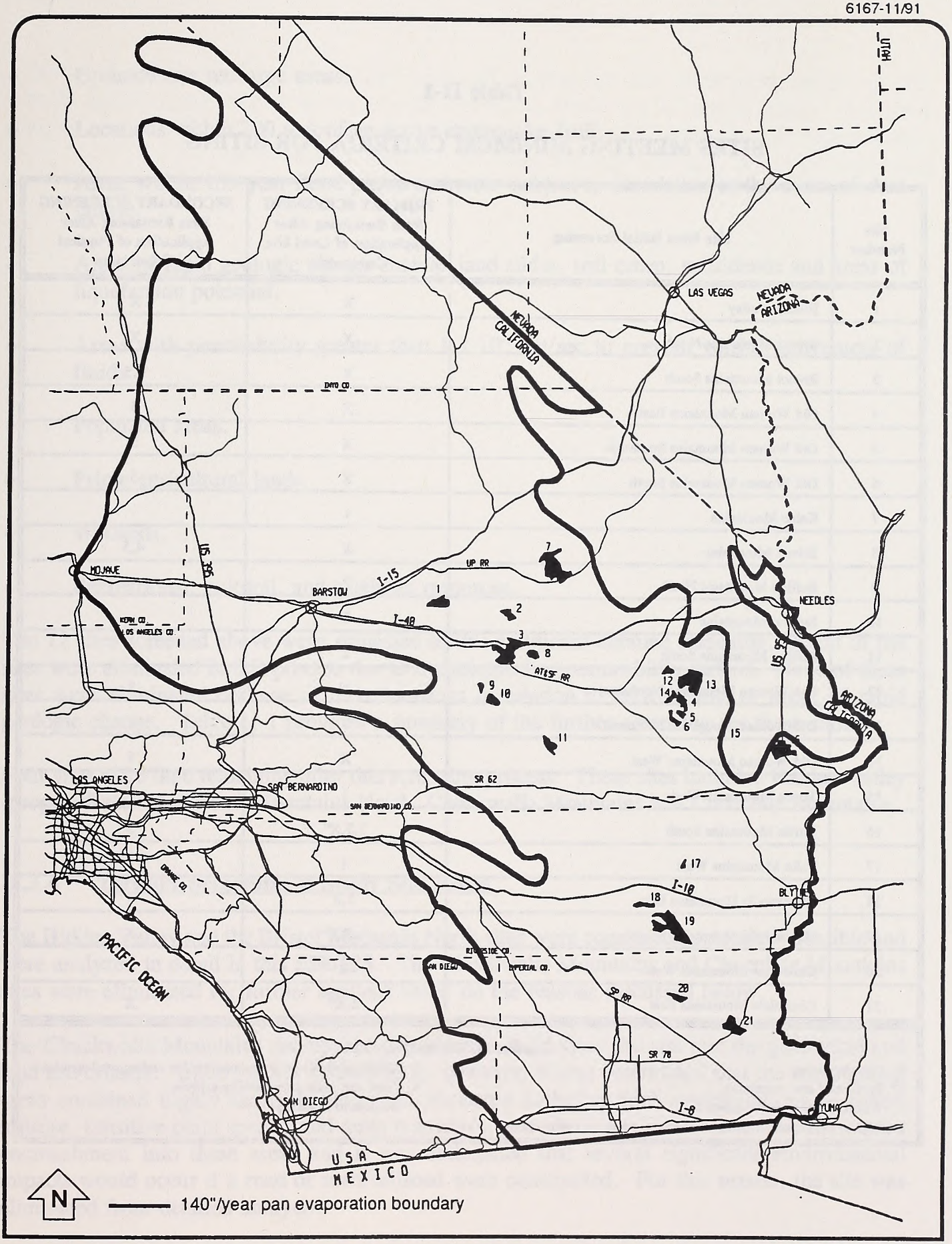
The 21 sites were evaluated based on several land use, geologic, topographic and hydrologic criteria. Land use criteria were selected to screen out incompatible land uses and areas denoted as sensitive resource areas. Because a great portion of land in the eastern portions of San Bernardino, Riverside and Imperial Counties are BLM owned lands, consideration was given to the California Desert Conservation Area Plan land designations. Consideration was also given to State hazardous waste management planning criteria as well as other agency regulatory requirements. The major criteria used for land use constraints included:

- National Monuments, Military reservations, national parks and wilderness areas.
- BLM Class C Multiple-Use areas as designated in the CDCA Plan, and Areas of Critical Environmental Concern (ACEC) and Special Areas also identified in the CDCA Plan.
- Areas closed to motorized vehicles.
- Critical habitats of threatened and endangered species.

During screening, portions of some sites were eliminated. The remainder of these sites were left in the study for further analysis. This screening resulted in leaving 12 sites for further analysis as shown in Table I1-1.

I1.3.3 Secondary Screening of Study Site Areas

Physical constraints were chosen to provide additional protection to the environment in addition to the early physical criteria discussed above. This phase of screening was also performed to meet the siting criteria under hazardous waste management planning. Elimination of sites due to major physical constraints included sites having:



TWENTY-ONE SITES MEETING MINIMUM CRITERIA

FIGURE
I1-2

Table I1-1

SITES MEETING MINIMUM CRITERIA FOR SITING

Site Number	Site from Initial Screening	PRIMARY SCREENING Sites Remaining After Application of Land Use Constraints	SECONDARY SCREENING Sites Remaining After Application of Physical Constraints
3	Hidden Valley	X	X
2	Bristol Mountains North	X	X
3	Bristol Mountains South	X	4,5
6	Old Woman Mountains East	X	5
5	Old Woman Mountains Southeast	X	5
6	Old Woman Mountains South	X	-
7	Kelso Mountains	1	5
6	Bristol Mountains	X	4,5
9	Bullion Mountains North	2	-
10	Bullion Mountains	2	-
10	Bullion Mountains South	2	-
10	Old Woman Mountains Northwest	X	5
13	Old Woman Mountains Northeast	3	-
10	Old Woman Mountains West	X	-
15	Turtle Mountains West	1	-
10	Turtle Mountains South	1,3,X[a]	-
17	Palin Mountains West	1	-
18	Chuckwalla Mountains East	1,3	-
19	Chuckwalla Mountains South	1,3,X[a]	-
20	Chocolate Mountains West	2	-
21	Chocolate Mountains East	2,X[a]	-

Reasons for Elimination

X Site remaining
X[a] Portion of site remaining
1 Within CDCA exclusionary area
2 Within parks, monuments, wilderness areas or reservations
3 Cirtical habitat of threatened and/or endangered species
4 Does not meet permeability criteria
5 Subject to flooding

- Groundwater recharge areas.
- Locations within 200 feet of an active earthquake fault.
- Areas within 100-year flood plains and areas subject to inundation in the event of dam failure.
- Areas of rapid geologic change such as land slides, soil creep, subsidence and areas of liquefaction potential.
- Areas with permeability greater than 1×10^{-7} cm/sec to prevent vertical movement of fluids.
- Populated areas.
- Prime agricultural lands.
- Wetlands.
- Recreational, cultural, and aesthetic resources.

The 12 sites screened above were subjected to this additional detailed screening. Eight of the sites were eliminated in this process due to hydrological or permeability factors. None of these sites were eliminated because of their locations in relation to active faults or areas of rapid geologic change. Table I1-1 provides a summary of the further screening for these sites.

Four sites were then remaining after this screening process. These sites included Hidden Valley (proposed action), Bristol Mountains North, Chuckwalla Mountains and Chocolate Mountains.

I1.3.4 Tertiary Screening of Study Site Areas

The Hidden Valley and the Bristol Mountain North sites were considered potentially feasible and were analyzed in detail in this EIR/EIS. The Chuckwalla Mountains and Chocolate Mountains sites were eliminated for further analysis based on the reasons discussed below.

The Chuckwalla Mountains site appeared feasible in itself since the site met the geological and land use criteria. Upon further investigation, however, it was determined that the surrounding areas contained highly sensitive biological resources including high concentrations of desert tortoise, sensitive plant species and quite restrictive land uses. Access to the site would require encroachment into these areas and it was anticipated that several significant environmental impacts would occur if a road or road/railroad were constructed. For this reason, the site was eliminated from detailed analysis.

The Chocolate Mountains site was primarily eliminated from further consideration due to transportation concerns. Primary access to the vicinity of the site was via two-lane highways

that are rather treacherous and not suitable for large numbers of trucks carrying hazardous materials. Train access is also more problematical and would require the building of an approximately 20 mile spur. Based on the haul distances and the access potential as well as the poor roadway access, this site was eliminated from further consideration.

APPENDIX I2

SITE ANALYSIS REPORT

Site Analysis Report

for the proposed

Hidden Valley Resources Residuals Repository

Prepared for:

Hidden Valley Resources, Inc.
1420 Crestmont Drive
Bakersfield, CA 93306

Prepared by:

Science Applications International Corporation

September 1991

APPENDIX I2 - SITE ANALYSIS REPORT

Page

SUMMARY I2-1

LIST OF FIGURES

Figure Page

S-1 HVR Siting Process I2-2

S-2 Evaluation of Candidate Sites I2-5

SUMMARY

Hidden Valley Resources, Inc. (HVR) has prepared a Site Analysis Report documenting the approach used to identify its proposed hazardous waste residuals repository site. HVR employed a systematic siting process to define the geographic limits of its site search, eliminate unsuitable areas from consideration, and identify and evaluate candidate sites. The process involved the sequential application of siting criteria designed to meet or exceed all regulatory requirements and accomplish the following goals:

- Minimum risk to public health and the environment from transport, handling, storage and disposal of hazardous waste residuals.
- Minimum adverse impact on the natural environment.
- Compatibility with other land uses.

The siting process was executed in stages, as illustrated in Figure S-1. First, a siting region was established limiting the investigation to counties in the Southern California Waste Management Authority. Second, areas with underlying materials that would provide a barrier between the repository and ground water were identified and evaluated. Regulations require residuals repositories to be underlain by a natural geologic barrier to ground water with a permeability of 10^{-7} centimeters per second or less. The only naturally occurring materials in the region able to meet this criterion are consolidated rock and clay. Consolidated rock shallower than ground water would generally be found within about 1/2 mile of mountainous areas. Clays in the region, if adequate, would generally be found in playas.

HVR selected consolidated rock because it is less vulnerable to effects of moisture and chemicals and provides the most stable foundation. Rock retains its high strength and low permeability in either wet or dry conditions and is resistant to chemical change. The physical makeup of consolidated rock is uniform, and it is the material least vulnerable to erosion and weathering.

HVR also evaluated 88 playas in southern California and found them to present unacceptable risks due to flood potential; shallow ground water; liquefaction; desiccation, sinking, and cracking; variable clay content; presence of soluble salts; and faults and ground-water barriers. Playas do not meet criteria set forth in Title 23, Subchapter 15 of the California Code of Regulations, which prohibit locating in areas of rapid geologic change, prescribe avoidance of adverse impacts to surface waters, and require setback from active faults.

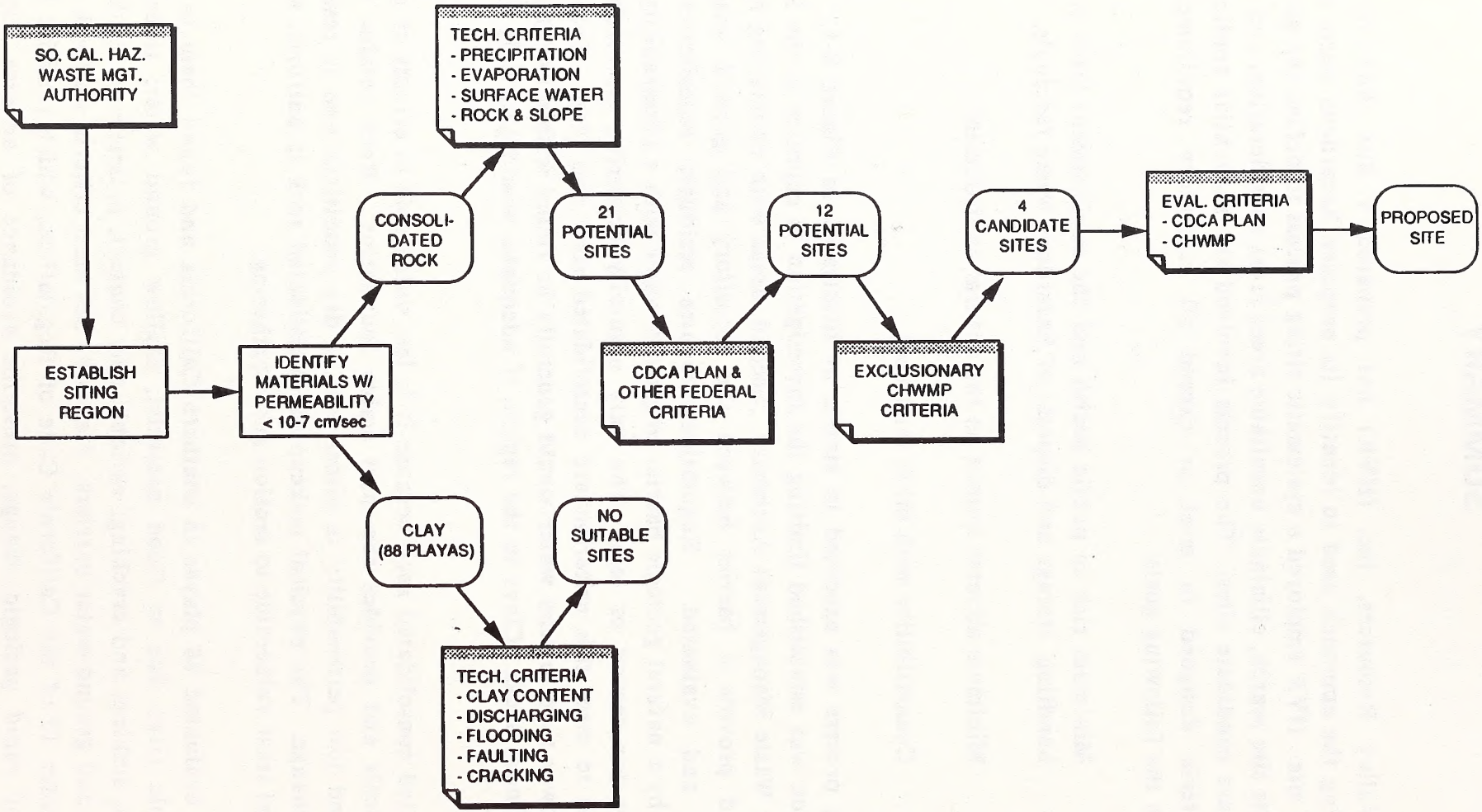


Figure S-1

HVR SITING PROCESS

Clay sediments are less uniform than rock, consisting of layered and stratified sands, silts, and salts in addition to the clay materials. The physical makeup of playas, along with the actual percent of clay, affects their permeability and, consequently, their reliability as a geologic barrier to ground water. In addition, when wet, playas do not provide a suitable, stable foundation for permanent facilities and structures. Unlike rock, the properties and bearing strength of clay vary depending on moisture content. Structures built on playas would be subject to extensive damage due to flooding and/or geologic changes, which creates an unacceptable condition for any permanent facility.

Once consolidated rock was identified as the only suitable underlying material, the siting process proceeded with a search for potential sites. Each stage of the process employed siting criteria to identify geographic features important in selecting a site for the proposed repository. Data from various sources were used to map the information in layers that were then combined to screen out undesirable areas and focus on the most promising opportunities.

A set of technical criteria was used to concentrate the site search in areas of southern California with the lowest risk for the formation of contaminants that might leach into ground-water resources. Unsuitable portions of the site search area were eliminated from the investigation, and potential sites were identified. Technical criteria used in siting were based on federal, state and applicable county regulations governing the siting of hazardous waste facilities, as well as on other factors which would contribute to the safety and stability of the proposed facility. These include precipitation, evaporation, proximity to water resources, surface rock and slope, seismic risk and geologic instability, flood potential, and permeability.

In addition to the technical criteria, HVR identified a set of exclusionary criteria to screen out incompatible land uses and sensitive resource areas. Since the driest parts of the state are contained within the California Desert Conservation Area (CDCA), the majority of the exclusionary criteria reflect elements of the CDCA Plan and were applied using data in the plan. These include Areas of Critical Environmental Concern (ACEC) and Special Areas, Class C Multiple-Use areas, areas closed to motorized vehicle access, utility corridors, and critical habitats of federal and state listed threatened and endangered species. National and state parks and monuments and military reservations were also excluded. The remaining sites were screened using applicable County Hazardous Waste Management Plan criteria.

The technical and exclusionary screening resulted in the identification of four candidate sites, located in Hidden Valley (Cady Mountains), the Bristol Mountains, the Chuckwalla Mountains, and the Chocolate Mountains. Evaluation criteria were

used to further examine and compare the candidate sites. These criteria incorporate additional risk-reduction considerations related to technical suitability, flexibility, and transportation safety. They also include additional environmental and land use considerations reflected in county plans and the CDCA Plan, such as encroachment by incompatible development, air quality, wildlife and wildlife management, conservation, recreation, and minerals and energy exploration and production. Figure S-2 summarizes the results of the evaluation of the four sites, based on performance relative to the siting goals and evaluation criteria.

The proposed site in Hidden Valley, surrounded by the Cady Mountains, provides the best conditions for minimizing risk to the public and to sensitive ground-water resources. The western half of the valley has a small, closed surface-water drainage basin of approximately 7.4 square miles which drains into Hidden Valley playa. The eastern half of the valley has open surface water-drainage and comprises approximately 12.6 square miles. External surface water drainage is confined to the northeast corner of the valley.

The rocks underlying the surface form a basin that is about 3/4 the size of the valley. Ground water is in excess of 1,000 feet below the surface. The massive granite and volcanic rocks vary in depth from surface, at the valley edges, to approximately 580 feet below the surface at the center of the underlying rock basin. Together, the underlying rock and deep ground water provide exceptionally low risk of contamination. The extreme depth to ground water has precluded the development of drinking water supplies in the area in the past and makes future encroachment unlikely.

The other three sites do not provide comparable geophysical conditions. Surface water drainage is a concern at two of the sites, and the Chocolate Mountains site has relatively poor highway access. Impacts on the natural environment are a serious concern at the Chuckwalla Mountains site, rendering it unsuitable as an alternative. Land use compatibility did not significantly differentiate the sites.

Figure S-2

EVALUATION OF CANDIDATE SITES

GOAL	MINIMUM RISK						MINIMUM ENVIRON. IMPACTS			COMPATIBLE LAND USE				
CRITERION / SITE	TECHNICAL SUITABILITY	FLEXIBILITY	DISTANCE TO GENERATORS	RAIL W/IN 20 MILES	MAJOR HIGH-WAY W/IN 20 MI.	TRAVEL IN SEN-SITIVE AREAS	IMPACTS ON RARE SPECIES	CDCA WILD-LIFE MGT.	AIR EMISSIONS	PRIVATE LAND AVAIL.	ENCROACH-MENT	MULTIPLE-USE CLASS	GRAZING ALLOTMENT	MINERALS & ENERGY RES.
HIDDEN VALLEY	(G)	(G)	(G)	(G)	(G)	(G)	(Y)	(Y)	(Y)	(G)	(G)	(Y)	(Y)	(Y)
BRISTOL MOUNTAINS (NORTH)	(Y)	(Y)	(Y)	(Y)	(G)	(G)	(G)	(G)	(Y)	(G)	(G)	(Y)	(G)	(G)
CHUCKWALLA MOUNTAINS (SOUTH)	(Y)	(R)	(Y)	(R)	(G)	(G)	(R)	(R)	(G)	(R)	(G)	(Y)	(G)	(Y)
CHOCOLATE MOUNTAINS (EAST)	(Y)	(Y)	(R)	(G)	(R)	(Y)	(G)	(Y)	(Y)	(G)	(Y)	(G)	(G)	(R)

(G) FAVORABLE

(Y) POTENTIAL CONCERN

(R) UNFAVORABLE

APPENDIX J

U.S. FISH AND WILDLIFE SERVICE BIOLOGICAL OPINION

United States Department of the Interior

FISH AND WILDLIFE SERVICE

FISH AND WILDLIFE ENHANCEMENT
SOUTHERN CALIFORNIA FIELD STATION
2730 Loker Avenue West
Carlsbad, California 92008

TAKE PRIDE IN AMERICA

1992 OCT 13 PM 12:

BARSTOW, CA

October 8, 1992

Memorandum

To: State Director, Bureau of Land Management, Sacramento, California

From: Acting Field Supervisor J. M. Sanchez

Subject: Biological Opinion for the Proposed Hidden Valley Resources Residual Repository Proposal, San Bernardino County, California (CA-24320 2800(CA0068.06)) (1-6-92-F-57)

This biological opinion responds to your request for formal consultation with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act). Your request for consultation was dated July 16, 1992, and was received by us on July 21, 1992. At issue are the impacts that the construction and operation of the proposed Hidden Valley Resources Residual Repository Proposal in the Cady Mountains of San Bernardino County, California, may have on the desert tortoise (Gopherus agassizii), a federally listed threatened species.

This biological opinion was prepared using information: contained in your request for consultation to the Service's Regional Office in Portland, Oregon; obtained during informal consultation between our staffs; and contained in our files.

Biological Opinion

It is the opinion of the Service that the proposed project is not likely to jeopardize the continued existence of the desert tortoise. Critical habitat has not been designated for this species in California. Therefore, the proposed action would not adversely modify critical habitat.

Description of the Proposed Action

Hidden Valley Resources, Inc., is proposing to construct and operate a facility for the disposal and storage of dry, treated, and stabilized hazardous waste materials. The materials would be transported to the site by truck and train. Storage would be in underground structures which would allow for future recovery or recycling as treatment technologies become available.

The following information briefly describes the proposed action. More complete information, including descriptions of the alternative actions that

are being considered as part of the Bureau's National Environmental Policy Act documentation, is contained in Chambers (1992).

The access route for the proposed facility would begin at the existing Hector off-ramp from Interstate 40 and an existing railroad siding connected to the main Santa Fe Railroad line. Construction of a 26-foot-wide, two-lane paved road would be required to provide initial access to the site. The proposed access route follows an existing dirt road for two of its 13 miles.

The railroad line from Hector to the facility would be constructed approximately two or three years after the onset of operations. Where the railroad would parallel the road, the right-of-way would be 120 feet wide, except for areas of mountainous terrain, where the width would be 200 feet. The right-of-way between Hector and Interstate 40, where only a road would be constructed, would be 60 feet wide. Any utility lines needed for the facility, such as gas or electric lines, would be placed within this right-of-way. The proposed action also contains a 120-foot-wide right-of-way within the repository itself for an access road, conveyor system railspur, and utilities. Attachment 1 depicts the proposed access network, which is located primarily on lands administered by the Bureau.

The administrative and receiving area would occupy approximately 28.27 acres of private land and consist of equipment and maintenance shops, security and fire stations, testing laboratories, truck and rail facilities, sand blasting, and steel fabrication. Portable rock and concrete batch plant sites would also be placed at the facilities area.

The containment areas for waste disposal would be located on 1,259 acres of land owned by Hidden Valley Resources, Inc. The first phase of disposal would occur in sections 1, 5, and 29 and would occupy 530 acres. Approximately 729 acres in sections 29 and 33 would be used for disposal during phase 2 (attachment 2).

Hidden Valley Resources, Inc. anticipates that the initial volumes of material would be too small to justify transportation by rail and would be conveyed to the site in 35 to 45 trucks per day. When operating at full capacity, Hidden Valley Resources, Inc. anticipates that 20 to 25 percent of the daily volume of 1,800 tons of waste would be transported by trucks and the remainder by rail. This amount equates to approximately 25 trucks per day.

Chambers (1992) contains detailed descriptions of site preparation and waste disposal procedures. Hidden Valley Resources anticipates that approximately five acres per year would be disturbed by new activities with approximately 200 acres being actively used at any one time. The projected life of the facility is 120 years.

Telephone lines and possibly natural gas lines would be placed underground within the access road right-of-way. The biological assessment notes that electrical lines would also be placed underground, although the technical information for this proposal was not included. On September 21, 1992, the Barstow Resource Area biologist informed Service staff that Hidden Valley

Resources had decided to use standard above-ground transmission lines in place of underground lines.

The Bureau included the following mitigation measures with its request for formal consultation:

1. The proponent shall designate a field contact representative (FCR) who will be responsible for overseeing compliance with protective stipulations for the desert tortoise and for coordination on compliance with Bureau. The FCR shall have the authority to halt all project activities that are in violation of the stipulations. The FCR may be an agent for the proponent, the site manager, any other project employee, or a contracted biologist.

2. An employee education program must be received, reviewed, and approved by the Bureau at least 15 days prior to the presentation of the program. The program may consist of a class or video presented by a qualified biologist or a video. Wallet-sized cards with important information for workers to carry are recommended. All project employees shall participate in the desert tortoise education program prior to initiation of project activities. The proponent is responsible for ensuring that the education program is developed and presented prior to conducting activities. New employees shall receive formal, approved training prior to working on-site. The program shall cover the following topics at a minimum:
    - distribution of the desert tortoise,
    - general behavior and ecology of the desert tortoise,
    - sensitivity to human activities,
    - legal protection,
    - penalties for violations of State or Federal laws,
    - reporting requirements, and
    - project protective mitigation measures.

3. Only biologists authorized by the Service under the auspices of a biological opinion shall handle desert tortoises. The proponent shall submit the name(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities. No project activities shall begin until an authorized biologist is approved. Authorization for handling will be granted under the auspices of the Hidden Valley Resources Repository Project section 7 consultation.

4. The authorized biologist shall be required on-site during the initial construction activities. This biologist shall have authority from the proponent to halt any action that might result in harm to a desert tortoise.

5. The area of disturbance shall be confined to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. Work area boundaries shall be delimited with flagging or other marking to minimize surface disturbance associated with vehicle straying. Special

habitat features, such as burrows, identified by the qualified biologist shall be avoided to the extent possible. To the extent possible, previously disturbed areas within the project site shall be utilized for the stockpiling of excavated materials, storage of equipment, digging of slurry pits, location of office trailers, and parking of vehicles. The qualified biologist, in consultation with the project proponent, shall ensure compliance with this measure.

6. For project development where the project is in desert tortoise habitat, the entire site shall be enclosed within a desert tortoise-proof fence. All access roads, borrow/repository areas and operational facilities shall be fenced in this manner during the inactive desert tortoise season (June 15 - September 1; November 15 - March 1). The fence shall be constructed under the direction of the authorized biologist. The fence shall be located to avoid all desert tortoise burrows; to the extent possible, burrows will be placed on the outside of the exclosure. The fence shall be constructed of 1/2-inch mesh hardware cloth. It shall extend 18 inches above ground and 12 inches below ground. Where burial of the fence is not possible, the lower 12 inches shall be folded outward against the ground and fastened to the ground to prevent desert tortoise entry. The fence shall be supported sufficiently to maintain its integrity. The fence shall be checked at least monthly and maintained when necessary by the mine operator to ensure its integrity. All desert tortoise-proof fencing shall be removed after site rehabilitation.

7. After fence installation, the authorized biologist shall conduct a thorough survey for desert tortoises within the mine site. All desert tortoises found within fenced areas shall be marked and removed from the exclosure and placed outside the nearest fence. If the removal is during the season of above-ground activity, the desert tortoises shall be placed beside a nearby burrow of appropriate size. If the removal is not in the season of above-ground activity, the desert tortoise shall be moved (dug out of burrow if necessary) on a seasonably warm day and placed at the mouth of a nearby burrow of appropriate size. If the desert tortoise does not enter the burrow, an artificial burrow may be needed. The authorized biologist shall be allowed some judgement and discretion to ensure that survival of the desert tortoise is likely.

8. Fragmentation of desert tortoise habitat shall be reduced through the installation of culverts under the road and railroad at all washes and at 0.5 mile intervals. Culverts shall be maintained to remove trash and other debris at least twice per year.

9. Desert tortoises moved from within a fenced site shall be marked for future identification. An identification number using the acrylic paint/epoxy covering technique shall be placed on the fourth left costal scute (Fish and Wildlife Service 1990). 35-mm slide photographs of the carapace, plastron, and the fourth costal scute shall be taken. No notching is authorized.

10. Desert tortoises may be handled only by the authorized biologist and only when necessary. New latex gloves shall be used when handling each desert tortoise to avoid the transfer of infectious diseases between animals. Aside from the initial site clearance, any desert tortoise moved shall be placed in the shade of a shrub in the direction in which it was facing when found or at the entrance to a burrow if hibernating. In general, desert tortoises should be moved the minimum distance possible to ensure their safety.

11. The authorized biologist shall maintain a record of all desert tortoises encountered during project activities. This information shall include for each desert tortoise:
    1) the locations (narrative and maps) and dates of observations;
    2) general condition and health, including injuries and state of healing and whether animals voided their bladders;
    3) location moved from and location moved to;
    4) diagnostic markings (i.e., identification numbers or marked lateral scutes).

12. No later than 90 days after completion of construction activities, the FCR and authorized biologist shall prepare a report for the Bureau. The report shall document the effectiveness and practicality of the mitigation measures, the number of desert tortoises excavated from burrows, the number of desert tortoises moved from the site, the number of desert tortoises killed or injured, and the specific information for each desert tortoise as described in measure 11. The report shall make recommendations for modifying the stipulations to enhance desert tortoise protection. The report shall provide an estimate of the actual acreage disturbed by various aspects of the operation.

13. Upon locating a dead or injured desert tortoise, the proponent is to notify the Bureau. The Bureau must then notify the appropriate field office (Ventura) of Service by telephone within three days of the finding. Written notification must be made within five days of the finding. The information provided must include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death, if known, and other pertinent information. Desert tortoise remains shall be collected, delivered to the Bureau, and frozen as soon as possible. Injured animals shall be transported to a qualified veterinarian for treatment at the expense of the project proponent. If an injured animal recovers, the Service should be contacted for final disposition of the animal.

14. All trash and food items shall be promptly contained within raven-proof containers. These shall be regularly removed from the project site to reduce the attractiveness of the area to ravens and other desert tortoise predators.

15. Structures that may function as raven nesting or perching sites are not authorized except as specifically stated by the Bureau. The project proponent shall describe anticipated structures to the Bureau during initial project review.

16. At the end of the project, disturbed areas, including new access roads, shall be recontoured and reseeded with an appropriate mixture of native plant species according to Bureau specifications. After site rehabilitation, all desert tortoise-proof fence shall be removed.

17. Desert tortoise habitat acreage totalling 6,800 acres shall be purchased by the proponent and transferred to the Bureau. All compensation lands shall be within Bureau designated Category I desert tortoise habitat within the West Mojave Region and shall be approved by the Bureau prior to satisfaction of this requirement. Acquisition of compensation lands shall be coordinated through the California Desert District Realty Staff. Compensation requirements must be satisfied within one year of mining plan authorization.

The biological assessment prepared by the Chambers Group (1992) also briefly describes proposed mitigation measures. These measures, which are similar to the Bureau's, are:

1. limitation of all work activities to designated work areas;

2. construction of a desert tortoise-proof fence around the project facilities and on both sides of the access corridor for the extent of the project within desert tortoise habitat;

3. removal of desert tortoises from the right-of-way;

4. reduction in the attractiveness of the area to common ravens;

5. installation and maintenance of culverts under the road and railroad at a minimum of 0.5-mile intervals;

6. specification of the design, construction, and maintenance of the desert tortoise-proof fence;

7. identification of procedures to be used when desert tortoises are encountered.

Effects of the Proposed Project on the Listed Species

Species Account

On August 4, 1989, the Service published an emergency rule listing the Mojave population of the desert tortoise as endangered. On April 2, 1990, the Service determined the Mojave population of the desert tortoise to be threatened through publication of a final rule. The Service is currently in the process of developing a recovery plan. Critical habitat has not been proposed for the desert tortoise in California, Arizona, and Nevada.

The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. Generally, tortoises are active during the spring and early

summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rain storms. Tortoises spend the remainder of the year in burrows, escaping the extreme weather conditions of the desert.

Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), and Weinstein et al. (1987).

Creosote bush (Larrea tridentata), bursage (Ambrosia dumosa), and cheesebush (Hymenoclea salsola) are common perennial species within the facilities and containment area. Some disturbance by cattle has occurred within this area. Bursage and creosote are also the most common species along the access route. Portions of the route cross blowsand and desert pavement areas.

In 1988, 18 standard Bureau transects were conducted for desert tortoises in the facilities area. Attachment 3 depicts the estimated distribution of desert tortoise habitat within Hidden Valley. A 40-acre dry lake bed in section 29 is considered to be unsuitable for desert tortoises because of the lack of vegetation. Chambers (1992) notes that no desert tortoises were found in sections 30, 31, and 32 during the 1988 survey and concludes that sections 6, 31, and 32 are marginal habitat. The biological assessment also states that sections 30, 31, and 32 have "appropriate vegetation" and soft loamy soils, which "would limit the structural integrity of a burrow" (Chambers 1992). In general, the central area of the valley seems to support the lowest desert tortoise densities, with higher densities occurring in the southwest and east. The Bureau classifies Hidden Valley as interim Category 3 and notes that the upper respiratory tract disease has not been documented in this area.

In 1991, the Chambers Group conducted 23 modified transects along potential access routes. Most of the proposed route supported desert tortoise densities of 0 to 20 per square mile. Three miles of the route, located in two separate portions along the lower foothills of the Cady Mountains, supported densities of 21 to 50 desert tortoises per square mile (attachment 4). Chambers notes that most desert tortoise sign was detected in washes where soil conditions were considered more suitable for burrowing.

Analysis of Impacts

The proposed project would result in the take of desert tortoises which inhabit the facility and containment sites, and access right-of-way. These impacts, including the loss of habitat within these areas, would occur during the construction phase of the proposed action. Additional desert tortoises could be taken if measures are not implemented to prevent animals from entering work areas, the rail line, and the access road.

Approximately 211 acres of habitat would be destroyed within the access right-of-way, which would include the railroad, road, and utilities. Chambers (1992) assumes that all construction impacts for these features would be confined to within the right-of-way. The proposed facility and containment area would occupy approximately 1,355 acres within Hidden Valley. An

additional 134 acres would be "functionally" lost, presumably as small parcels of native habitat are isolated by project facilities (Chambers 1992).

The proposed action may also have several indirect adverse impacts on the desert tortoise. Construction activities, facility operation, and carcasses of animals killed on the access road could result in increased numbers of common ravens (Corvus corax), which are known to prey on desert tortoises, in the vicinity of Hidden Valley. The access routes, both from Hector to the containment area and within the containment area, would fragment desert tortoise habitat through the establishment of barriers to movement. Non-project associated use of the improved access road would also potentially add to the number of road-killed animals and increase opportunities for vandalism and collection of desert tortoises.

Although portions of the project area support relatively low densities of desert tortoises and the Bureau has designated the Cady Mountains as interim Category 3 habitat, the local desert tortoise populations may be important in the eventual recovery of the species in the western Mojave Desert. The local absence of the upper respiratory tract disease that has affected desert tortoises west of Barstow may be a result of the area's relative isolation. Until the problems caused by the disease in the western Mojave Desert are solved, the Service believes that areas that contain uninfected desert tortoises should be carefully managed to maintain their viability.

Most of the habitat that would be disturbed as a result of the proposed action is on land owned by Hidden Valley Resources. Primarily access routes are located on public lands administered by the Bureau. However, the Service believes that the protective stipulations developed by the Bureau and the terms and conditions contained in this biological opinion are appropriate and necessary for implementation on all lands occupied and affected by the proposed action. Because the action could not proceed without use of the rights-of-way across public lands, we consider these actions to be interdependent as defined at 50 CFR 402.02. If Hidden Valley Resources decides that it does not wish to implement the protective stipulations developed by the Bureau and the terms and conditions contained in this biological opinion on its lands, the Service would recommend that it submit an application for a section 10(a)(1)(B) permit to allow for the incidental take of desert tortoises.

Our evaluation of the biological assessment leads us to believe that the proposed action may be highly speculative in nature. If the proposed action is fully implemented, the life of the project would likely extend for several decades. Thus, impacts to desert tortoises and their habitat could occur in the future that cannot be anticipated at this time. Strict compliance with the various reporting requirements of the Bureau and the Service and detailed review of these reports will be needed to ensure that unanticipated impacts are detected and minimized or eliminated at the earliest possible time.

The Bureau has proposed numerous measures, described previously in this biological opinion, to reduce the direct take of desert tortoises and to minimize the loss of habitat. These measures are consistent with actions that have been implemented to protect desert tortoises during construction and

operation of numerous projects. In general, the Service believes that these measures are successful in reducing the direct take of desert tortoises during construction activities. However, the success of some mitigation measures, such as moving desert tortoises out of rights-of-way during construction and litter control programs, have not been evaluated on a long-term basis at this time.

The Bureau's request for formal consultation also notes that the applicant would be required to compensate, through the acquisition of private lands, for habitat that would be destroyed by the proposed action. Mitigation of this nature does not reduce the take of desert tortoises by the proposed action. However, the Service believes that such acquisitions have the potential to improve the overall management of the species, because section 7 of the Act requires all Federal agencies to consult with the Service on any discretionary actions in which they engage that may adversely affect listed species. This requirement is stricter than that placed on non-Federal actions, where the standard contained in the Act prohibits the take of listed species. Furthermore, the Service views the Bureau's compensation policy as a means of implementing section 2 of the Act, which enjoins all Federal agencies to use their authorities to conserve listed species. Implementation of the proposed action would include the acquisition and management of compensation lands for the benefit of desert tortoises, which would have at least some beneficial impact on this species.

The Service believes that the impacts described above will not jeopardize the continued existence of the species. We present this conclusion for the following reasons:

1. The project site occurs in habitat that supports relatively low densities of desert tortoises.

2. The Bureau's environmental assessment includes mitigation measures which would reduce the take of individual desert tortoises and their habitat.

Cumulative Effects

Cumulative effects are those impacts of future State and private actions that are reasonably certain to occur in the project area. Future Federal actions will be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project.

Many of the actions that are reasonably expected to occur within the vicinity of the project will be subject to section 7 consultations, because large portions of the desert are Federal land managed by the Bureau or the Department of Defense. The Service is unaware of any State and private actions that are reasonably certain to occur in the project area that may result in further loss or degradation of desert tortoise habitat and the take of desert tortoises.

Incidental Take

Section 9 of the Act prohibits the take of listed species without special exemption. Taking is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take statement. The measures described as reasonable and prudent measures and terms and conditions in this biological opinion are nondiscretionary, and must be undertaken by the agency or made a binding condition of any grant or permit, as appropriate.

This biological opinion anticipates the following forms of take which would be associated with implementation of the reasonable and prudent measures:

1. Two (2) desert tortoises in the form of direct mortality during construction of project facilities.

2. One (1) desert tortoise every two (2) years in the form of direct mortality during operation of the proposed facility.

3. Fifteen (15) desert tortoises in the form of harassment resulting from moving animals out of harm's way during construction and operation of the proposed project.

This biological opinion does not authorize any form of take that is not incidental to construction and operation of the Hidden Valley Resources residual repository facility.

If the incidental take authorized by this biological opinion is met, the Bureau shall immediately notify the Service in writing. If the incidental take authorized by this biological opinion is exceeded, the Bureau shall immediately notify Hidden Valley Resources to cease the activity resulting in the take and shall reinitiate formal consultation with the Service.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize incidental take:

1. Worker education programs, defined work areas, and well-defined operational procedures shall be implemented, with the cooperation of on-site qualified biologists, to avoid the take of desert tortoises and minimize loss of their habitat during construction and operation of the proposed facility.

2. Attraction of common ravens to the waste disposal site shall be reduced to the maximum extent possible.

Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the Bureau is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above.

1. If Hidden Valley Resources fails to comply with any of the reasonable and prudent measures or terms and conditions of this biological opinion, the Bureau shall suspend the right-of-way permit for the public lands until such time that Hidden Valley Resources is in compliance with these terms and conditions. The Bureau shall also notify Hidden Valley Resources at that time that failure to comply will lead to revocation of the right-of-way permit.

2. The Bureau shall ensure that the following mitigation measures, which are contained in the Bureau's request for consultation and slightly modified herein by the Service, are implemented:

1. The proponent shall designate a field contact representative (FCR) who shall be responsible for overseeing compliance with protective stipulations for the desert tortoise and for coordination on compliance with Bureau. The FCR shall have the authority to halt all project activities that are in violation of the stipulations. The FCR may be an agent for the proponent, the site manager, any other project employee, or a contracted biologist.

2. An employee education program shall be submitted to and approved by the Bureau at least 15 days prior to the presentation of the program. The program may consist of a class or video presented by a qualified biologist or a video. Wallet-sized cards with important information for workers to carry are recommended. All project employees shall participate in the desert tortoise education program prior to initiation of project activities. The proponent shall ensure that the education program is developed and presented prior to conducting activities. New employees shall receive formal, approved training prior to working on-site. Hidden Valley Resources shall maintain records, which would be available to the Bureau and Service upon request, documenting that all employees have participated in the education program. The program shall cover the following topics at a minimum:

- distribution of the desert tortoise,
- general behavior and ecology of the desert tortoise,
- sensitivity to human activities,
- legal protection,
- penalties for violations of State or Federal laws,
- reporting requirements, and
- project protective mitigation measures.

3. Only biologists authorized by the Service under the auspices of this biological opinion shall handle desert tortoises. The proponent shall

submit the name(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities. No project activities shall begin until an authorized biologist is approved.

4. The authorized biologist shall be required on-site during the initial construction activities. This biologist shall have authority from the proponent to halt any action that might result in harm to a desert tortoise.

5. The area of disturbance shall be confined to the smallest practical area, considering topography, placement of facilities, location of burrows, public health and safety, and other limiting factors. Work area boundaries shall be delimited with flagging or other marking to minimize surface disturbance associated with vehicle straying. Special habitat features, such as burrows, identified by the qualified biologist shall be avoided to the extent possible. To the extent possible, previously disturbed areas within the project site shall be utilized for the stockpiling of excavated materials, storage of equipment, digging of slurry pits, location of office trailers, and parking of vehicles. The qualified biologist, in consultation with the project proponent, shall ensure compliance with this measure.

6. For project development in desert tortoise habitat, the entire site shall be enclosed within a desert tortoise-proof fence. All access roads, borrow/repository areas and operational facilities shall be fenced in this manner during the inactive desert tortoise season (June 15 - September 1; November 15 - March 1). The authorized biologist shall be present during fence construction. The fence shall be located to avoid all desert tortoise burrows; to the extent possible, burrows shall be placed on the outside of the exclosure. The fence shall be constructed of 1/2-inch mesh hardware cloth. It shall extend 18 inches above ground and 12 inches below ground. Where burial of the fence is not possible, the lower 12 inches shall be folded outward against the ground and fastened to the ground to prevent tortoise entry. The fence shall be supported sufficiently to maintain its integrity. The fence shall be checked at least monthly and maintained when necessary by the Hidden Valley Resources to ensure its integrity. All desert tortoise-proof fencing shall be removed after site rehabilitation.

7. After fence installation, the authorized biologist shall conduct a thorough survey for desert tortoises within the Hidden Valley Resources site and right-of-way. All desert tortoises found within fenced areas shall be marked and removed from the exclosure and placed outside the nearest fence. If the removal is during the season of above-ground activity, the desert tortoises shall be placed beside a nearby burrow of appropriate size. If the removal is not in the season of above-ground activity, the desert tortoise shall be moved (dug out of burrow, if necessary) on a seasonably warm day and placed at the mouth of a nearby burrow of appropriate size. If the desert tortoise does not enter the burrow, an artificial burrow of similar size, depth, shape, and orientation as the original burrow shall be constructed. Excavation of

burrows that may be occupied by desert tortoises shall be by hand only, either by or under the direct supervision of the authorized biologist. The authorized biologist shall be allowed some judgement and discretion to ensure that survival of the desert tortoise is likely.

8. Fragmentation of desert tortoise habitat shall be reduced through the installation of culverts under the road and railroad at all washes and at 0.5 mile intervals. Culvert size, location, and installation shall be in accordance with methods developed by the Bureau's Desert Tortoise Research Group. Culverts shall be maintained to remove trash and other debris at least twice per year and to ensure that they are in all ways passable to desert tortoises, prior to its spring and late summer activity periods.

9. Desert tortoises moved from within a fenced site shall be marked for future identification. An identification number using the acrylic paint/epoxy covering technique shall be placed on the fourth left costal scute (Fish and Wildlife Service 1990). Thirty-five mm slide photographs of the carapace, plastron, and the fourth costal scute shall be taken. No notching is authorized.

10. Desert tortoises may be handled only by the authorized biologist and only when necessary. New latex gloves shall be used when handling each tortoise to avoid the transfer of infectious diseases between animals. Aside from the initial site clearance, any desert tortoise moved shall be placed in the shade of a shrub in the direction in which it was facing when found above ground or at the entrance to a burrow, if hibernating. In general, desert tortoises should be moved the minimum distance possible to ensure their safety.

11. The authorized biologist shall maintain a record of all desert tortoises encountered during project activities. This information shall include for each desert tortoise:

1) the locations (narrative and maps) and dates of observations;
2) general condition and health, including injuries and state of healing and whether animals voided their bladders;
3) location moved from and location moved to; and
4) diagnostic markings (i.e., identification numbers or marked lateral scutes).

12. No later than 90 days after completion of construction activities, the FCR and authorized biologist shall prepare a report for the Bureau. The report shall document the effectiveness and practicality of the mitigation measures, the number of desert tortoises excavated from burrows, the number of desert tortoises moved from the site, the number of desert tortoises killed or injured, and the specific information for each desert tortoise as described in measure 2.11. The report shall make recommendations for modifying the stipulations to enhance desert tortoise protection or reducing unnecessary hardship on the proponent. The report shall provide an estimate of the actual acreage disturbed by various aspects of the operation. Following initial construction activities, the Bureau shall ensure that Hidden Valley Resources

supplies reports of the amount of habitat destroyed by its operations and summary reports of all incidences of desert tortoise handlings and take on an annual basis, at a minimum. The Bureau shall forward a copy of these reports to the Service's Ventura Office with any additional information deemed necessary by the Bureau's project manager.

13. All trash and food items shall be promptly contained within raven-proof containers. These shall be regularly removed from the project site to reduce the attractiveness of the area to ravens and other desert tortoise predators.

14. At the end of the project, disturbed areas, including new access roads, shall be recontoured and reseeded with an appropriate mixture of native plant species according to Bureau specifications. After site rehabilitation, all desert tortoise-proof fence shall be removed under the direction of an authorized biologist.

15. The proponent shall acquire and transfer lands within Bureau-designated Category I desert tortoise habitat within the West Mojave Region to the Bureau as compensation for residual impacts of the proposed action.

3. The Bureau shall ensure that common ravens do not nest on any structures erected by Hidden Valley Resources. Any above-ground utility poles shall be designed and installed to preclude nesting by common ravens. If common ravens construct nests on its facilities, Hidden Valley Resources or the Bureau shall be responsible for obtaining the appropriate permit from the Service's Division of Law Enforcement prior to the removal of the nests. The Bureau shall also ensure that Hidden Valley Resources monitors common raven use in the vicinity of the proposed facility in accordance with standard Bureau raven monitoring techniques.

4. The authorized biologist(s) shall follow the general handling methods contained in the "Protocols for Handling Live Tortoises" (Arizona Game and Fish Department et al. 1991). This biological opinion does not authorize replacement of lost fluids in any desert tortoise with a syringe or the drawing of blood.

Disposition of Dead, Injured, or Sick Desert Tortoises

Upon locating dead, injured, or sick desert tortoises, initial notification must be made within three working days of the finding to the Service's Division of Law Enforcement in Torrance at (310) 297-0062. The Service's Ventura Office should also be notified at (805) 644-1766. Written notification to both offices must be made within five calendar days and include the date, time, and location of the carcass, a photograph, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. The Bureau shall endeavor to place the remains of intact desert tortoises with educational or research institutions holding the appropriate State and Federal permits per their instructions. If such institutions are not available or the shell has

been damaged, the information noted above shall be obtained and the carcass left in place. The Bureau should consider marking the carcass in a manner that would not be toxic to other wildlife to ensure that it would not be re-recorded in the future.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by the Bureau through a biologist prior to implementation of the action. Injured animals should be transported to a qualified veterinarian. Should any treated desert tortoises survive, the Service should be contacted regarding the final disposition of the animals.

Conservation Recommendations

In furtherance of the purposes of sections 2(c) and 7(a)(1) of the Endangered Species Act that mandate Federal agencies to utilize their authorities to carry out programs for the conservation of listed species, we recommend implementing the following action:

1. The Service believes that the importance of relatively isolated, disease-free populations of desert tortoises, such as seems to be present in and around Hidden Valley, cannot be underestimated at this time. Therefore, the Bureau should fully evaluate the need and feasibility of the proposed action through its National Environmental Policy Act procedures and in relation to its section 2(c) and 7(a)(1) responsibilities. If these processes do not indicate that its merits outweigh the adverse environmental effects, we strongly recommend that the Bureau not issue a right-of-way permit for the proposed action.

The Service requests notification of the implementation of any conservation recommendations so we can be kept informed of actions that either minimize or avoid adverse effects, or that benefit listed species or their habitats.

Conclusion

This concludes formal consultation on proposed Hidden Valley Resources' residual repository facility. Reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is reached; 2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this biological opinion; 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this biological opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action (50 CFR 402.16). We would appreciate notification of your final decision on this matter. Any questions or comments should be directed to Ray Bransfield at the Ventura Office at (805) 644-1766.

Attachments

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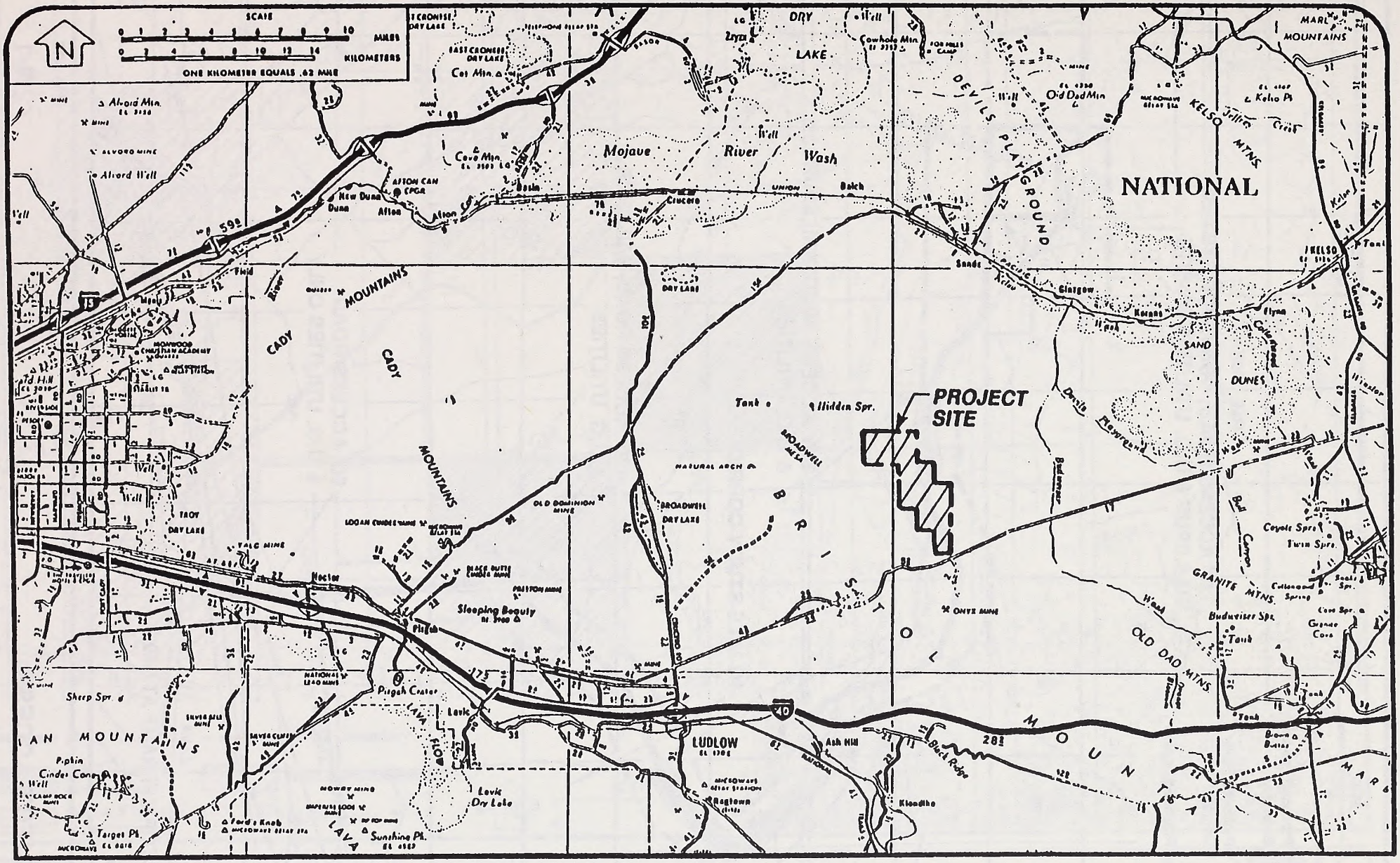
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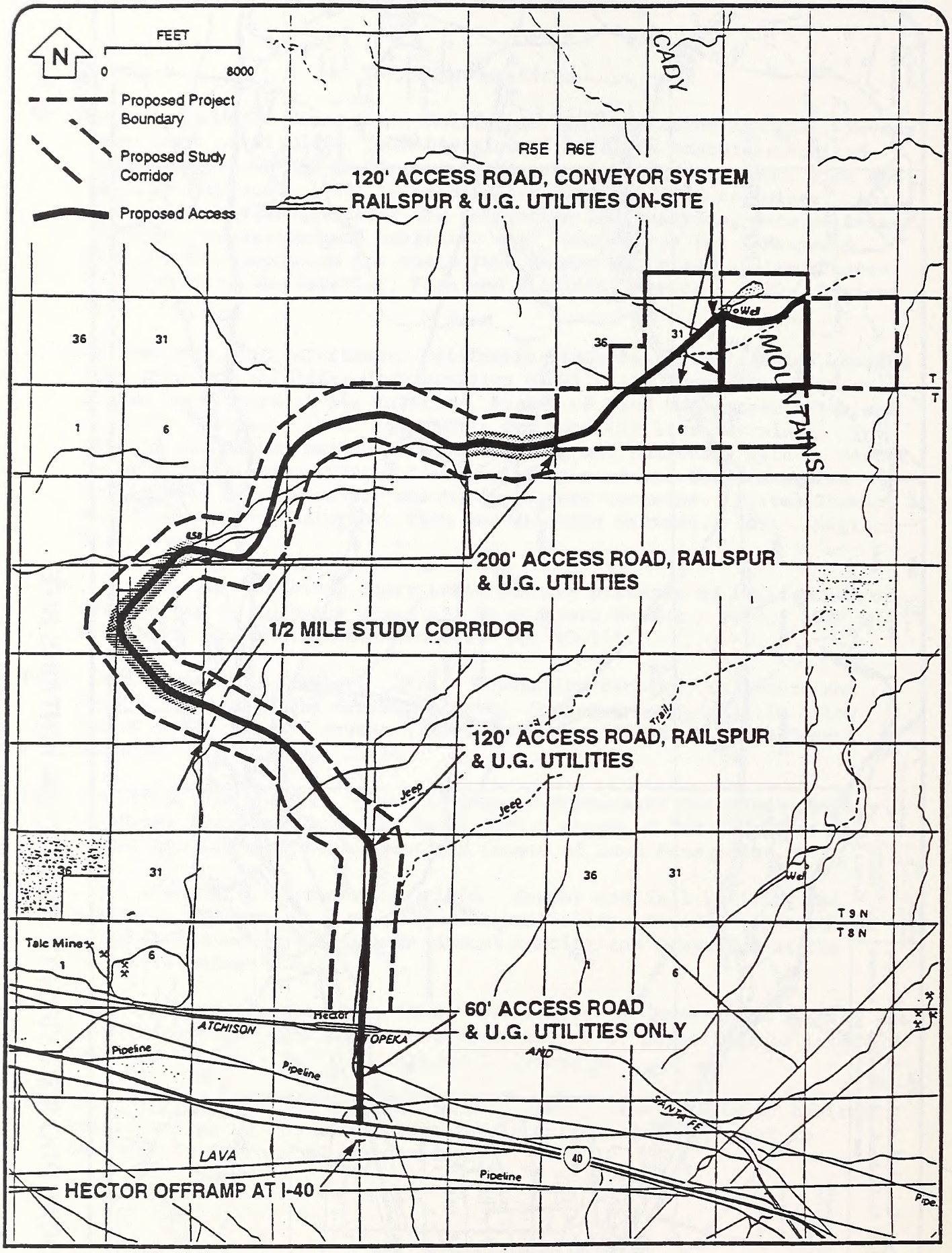
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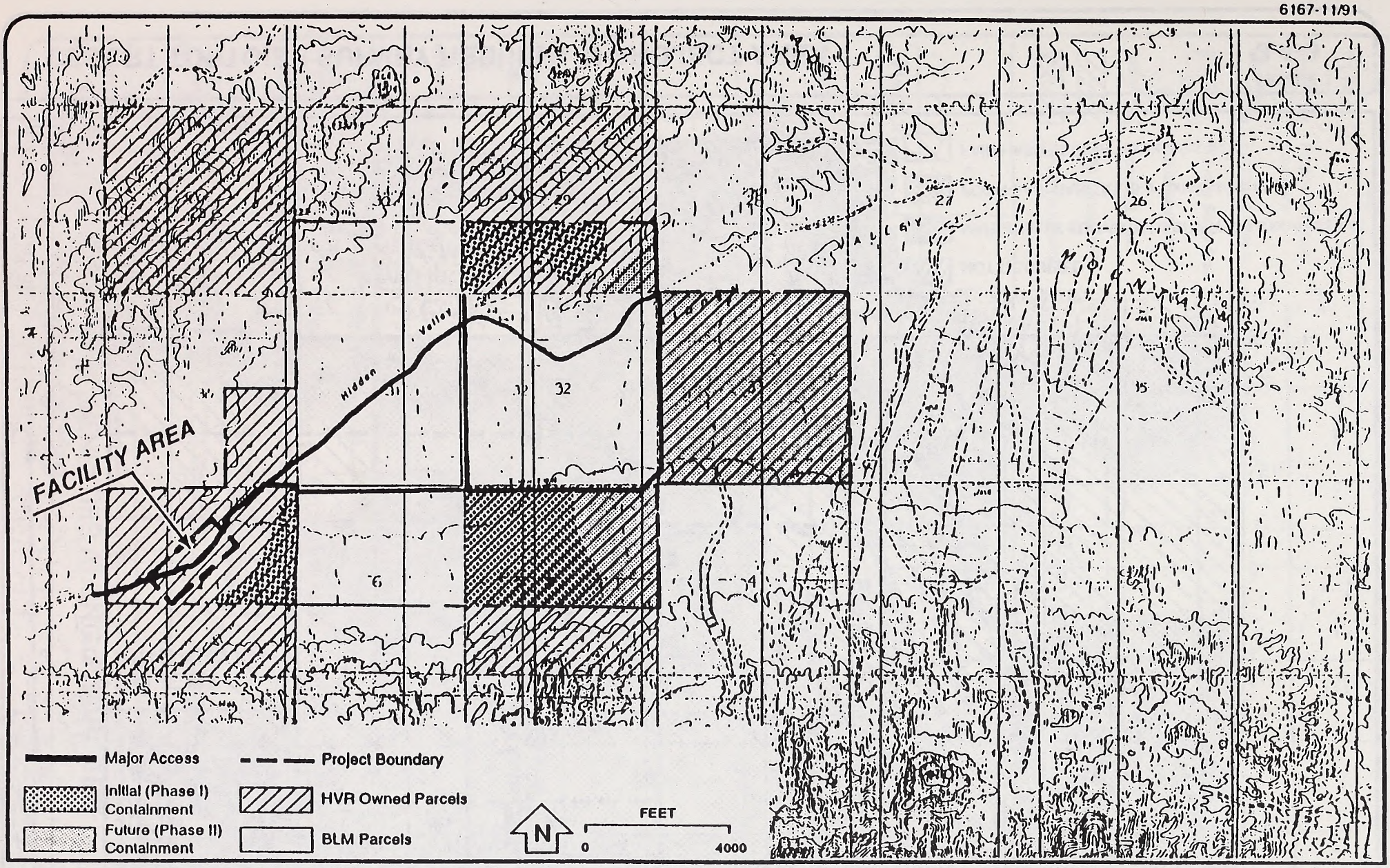

SCALE
MILES
KILOMETERS
ONE KILOMETER EQUALS .62 MILE
PROJECT SITE
NATIONAL
DEVILS PLAYGROUND
Mojave River Wash
DRY LAKE
CADY MOUNTAINS
BRISTOL MOUNTAINS
SAND DUNES
KELSO MTNS
MARL MOUNTAINS
GRANITE MTNS
OLD DAD MTNS
LUDLOW
Sleeping Beauty
Pisgah Crater
Lavic Dry Lake
Sunshine Pk.
Target Pk.
Ash Hill
Broadwell Dry Lake
Hidden Spr.
Tank
Kelso
Nebo
Afton
Daggett
Barstow
Newberry
Yermo
Manix
Troy Dry Lake
Sheep Spr.
Piptin Cinder Cone
Lavic
Kleindale
Ragtown
Budweiser Spr.
Coyote Spr.
Twin Spr.
Granite Spr.
Grande Cove
Bristol Mountains
Cady Mountains
Lava Flow
Old Dad Mtn.
Cowhole Mtn.
Cat Mtn.
Coxe Mtn.
Alvord Mtn.
Alvord Well
New Dunn
Afton Can
Glasgow
Kelso Pk.
Kelso Creek
Devils Playground
Broadwell Lake
Natural Arch
Old Dominion Mine
Onyx Mine
Talc Mine
Logan Cabin Mine
Mace Butte
Fenton Mine
Silver Queen Mine
Mowry Mine
Silver Bell Mine
National Lead Mine
Camp Rock
Moorpark College
Black Ridge
Bristol Wash
Cadiz Valley
Bristol Lake
Marl Mtns
Kelso Mtns
Kelso Pk
Kelso Creek
Sand Dunes



FIGURE

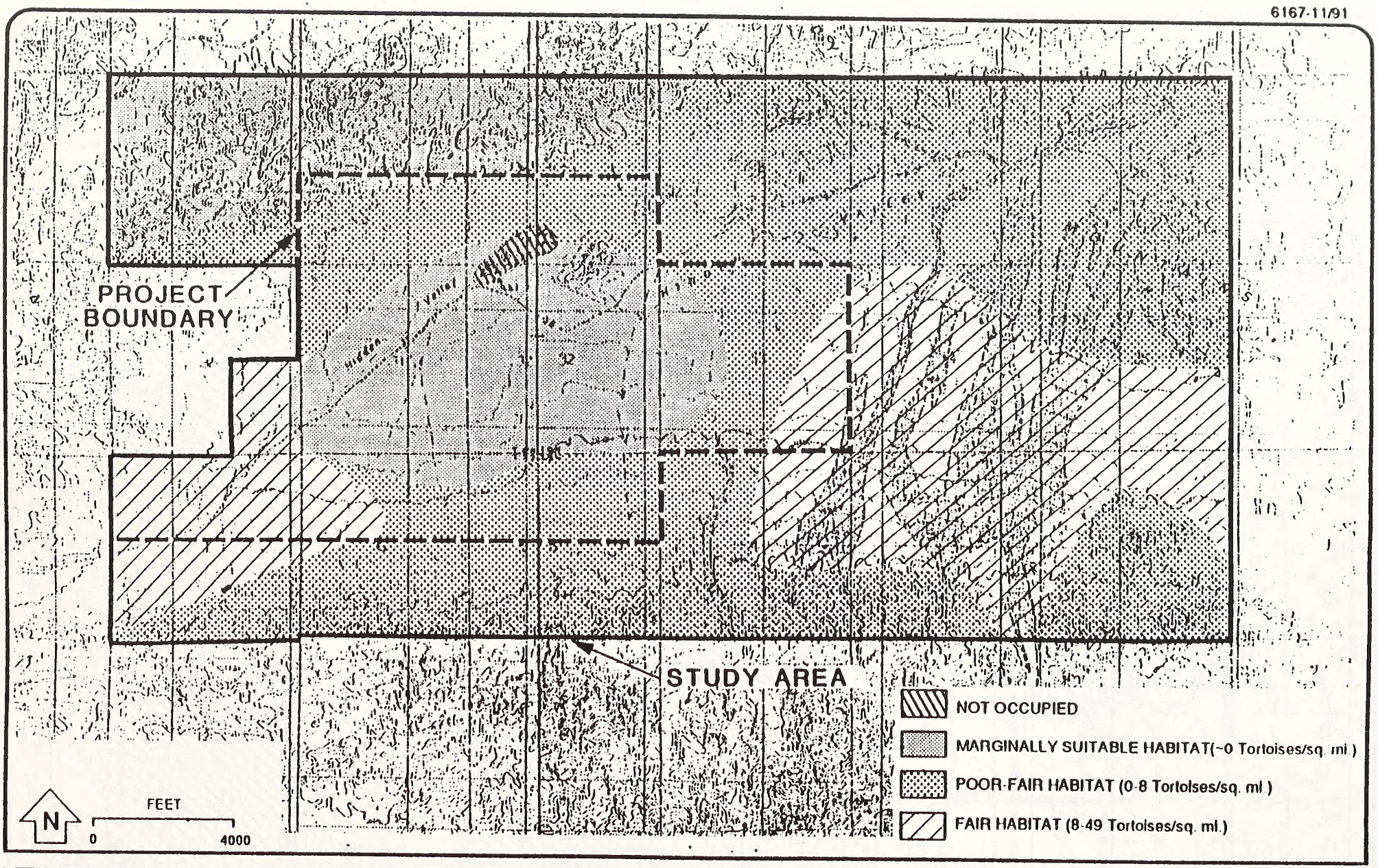
PROJECT ACCESS

2.2-1



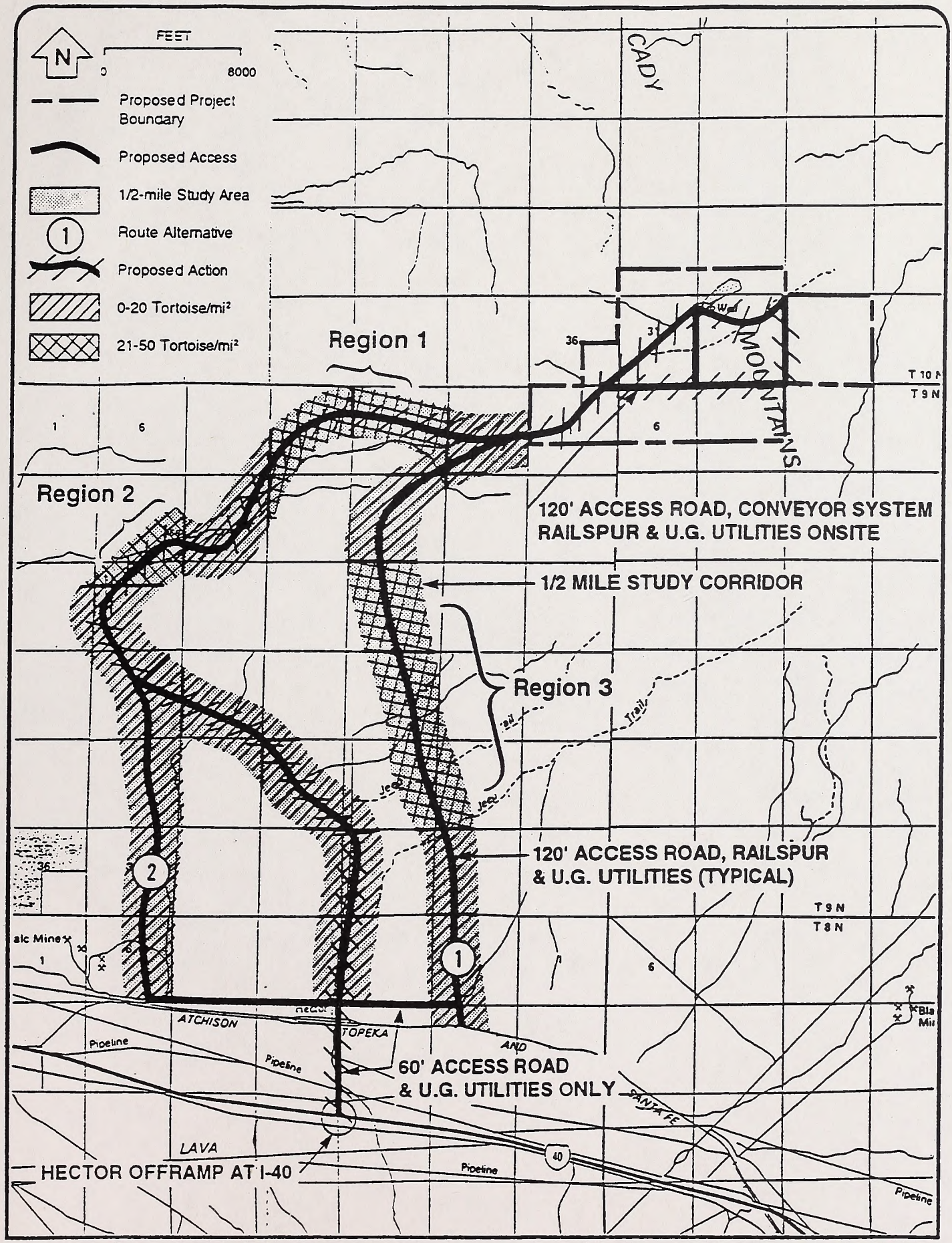
DEVELOPMENT PLAN

FIGURE
2.2-3



DESERT TORTOISE SURVEY RESULTS IN PROJECT AREA

FIGURE
3.4-3



ESTIMATED TORTOISE DENSITIES ALONG PROPOSED ACCESS AND ALTERNATIVES

FIGURE 3.4-4